



Environment

Prepared for:  
The BNSF Railway Company  
Seattle, WA

Prepared by:  
AECOM  
Seattle, WA  
60191113-0546  
August 20, 2012

# 2010/2011 Annual Site-Wide Groundwater Monitoring Report

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Skykomish, Washington




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## BNSF Former Fueling and Maintenance Facility - Skykomish, Washington



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## 1.0 Introduction

AECOM prepared this *Site-Wide Groundwater Monitoring Report* (report) on behalf of the BNSF Railway Company (BNSF) for the Former Fueling and Maintenance Facility (site) located in Skykomish, Washington. This report was prepared in accordance with the *2010 Groundwater Monitoring Plan* which is *Appendix E of the 2010 Compliance Monitoring Plan Update* (GWMP; AECOM 2010a). The GWMP was submitted by BNSF to the Department of Ecology (Ecology) and was subsequently approved pursuant to the Consent Decree between BNSF and Ecology, *State of Washington v. BNSF Railway Company*, King County Superior Court Cause No. 07-2-33672-9SEA. This report describes site-wide groundwater monitoring activities performed at the site from October 2010 to September 2011 (2010/2011 monitoring period). This monitoring period includes 1) semi-annual site-wide monitoring events completed in March and September 2011; 2) quarterly monitoring events in December 2010 and June 2011 for previously remediated areas; and 3) monthly monitoring of the air sparging system wells and hydraulic control and containment (HCC) system monitoring network wells that do not meet the groundwater remediation level (RL) through September 21, 2011.

### 1.1 Groundwater Monitoring Objectives

The *Groundwater Monitoring Plan* (GWMP) (RETEC 2005a, 2007; ENSR 2008a; AECOM 2009a; AECOM 2010a) established the following objectives for the groundwater monitoring program:

- Monitor any changes in contaminant distribution during and after implementation of cleanup actions throughout the site
- Provide monitoring data for groundwater in the Levee Zone to assess the effect of the 2006 interim cleanup on groundwater quality
- Provide monitoring data to evaluate 2008-2011 remediation impacts on groundwater quality
- Provide fluid level gauging data to assess groundwater and surface water gradients and the extent of free product.

Data was obtained during the 2010/2011 monitoring period to meet these groundwater monitoring objectives and is presented in this report.

### 1.2 Background

The site includes BNSF property and public and private properties within the Town of Skykomish (Town), 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).

Refer to Section 1.2 of the *2009/2010 Annual Site-Wide Groundwater Monitoring Report* (AECOM 2011), the Agreed Order (No. DE-2379), and BNSF and Ecology signed Consent Decree (CD, No. 07-2-33672-9 SEA) for details on the background of the site.

### 1.3 Report Organization

Section 1 of this report provides an introduction, background information, and 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 procedures and protocols 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. This 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 Groundwater Monitoring Network

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

### 2.1 Changes to the Monitoring Network

This section describes monitoring network changes implemented during the 2010/2011 monitoring period, including new well installation, well abandonment, and planned (but not completed) modifications. Modifications to the groundwater monitoring network and the rationale for the abandoned or destroyed wells are summarized in Table 2-1. These modifications were planned and completed with Ecology's concurrence. Modification plans and construction and/or abandonment details were presented in multiple site documents. One new monitoring well (EW-2A) was added to the groundwater monitoring network in the 2010 Specifications and 2010 GWMP (AECOM 2010c and a). Construction details for the newly installed well were specified in the 2010 Specifications (AECOM 2010c) and the completed well installation details are presented in Appendix A.

This report provides a summary of the monitoring functions (by site area or remediation system) and abandonment/destruction rationale for locations added to or removed from the groundwater monitoring network since October 1, 2010. Note that some monitoring locations are monitored for multiple purposes. Locations added to or removed from the groundwater monitoring network and their respective monitoring functions or abandonment/destruction rationales are discussed below.

#### 2.1.1 HCC System

**New well.** One well, EW-2A, was installed in May 2011 to assess groundwater quality and gradients at the east end of the extended HCC wall.

#### 2.1.2 Backfill and Downgradient of the HCC System Barrier Wall

**Planned, but cancelled or deferred.** Planned monitoring well 5-W-44 was not installed during this monitoring period due to the restoration activities completed in 2011. This monitoring well will be installed after restoration is complete.

#### 2.1.3 Levee Zone

**Abandoned.** Two wells (5-W-20 and 5-W-42) were located within the 2011 Levee West End excavation area and were therefore abandoned in May 2011 prior to excavation activities.

#### 2.1.4 Site-Wide

**Planned, but deferred.** Planned monitoring well 1A-W-38 was intended to replace abandoned wells 1A-W-3, which was abandoned before the 2009 construction season, and 1A-W-5, which was abandoned before the 2010 construction season. 1A-W-38 was deferred until excavation, construction, and restoration of the bridge area is complete. It will be installed during the 2011/2012 monitoring period.

**Abandoned/Destroyed.** One well, 1C-W-2, was inadvertently destroyed during 2009 sewer installation activities completed by the Town of Skykomish. An attempt was made to properly abandon this well but due to the new sewer line installed it is not possible to overdrill the broken well without damaging the sewer line. A well abandonment variance request was submitted to Ecology on March 15, 2012. AECOM and Ecology are continuing to work on an acceptable abandonment procedure.

## 2.2 2010 to 2011 Groundwater Monitoring Network

The current network of wells and piezometers is shown in Figure 2-1. This figure includes all well and piezometer locations including those not utilized for gauging or monitoring in this reporting period.

Table 2-2 summarizes 2010/2011 monitoring activities and corresponding event dates. Tables 2-3 and 2-4 present additional details regarding the sampling and gauging frequencies and wells and vaults utilized in the groundwater monitoring network. Well abandonment or destruction dates, where applicable, also are included in Tables 2-3 and 2-4, to help clarify the rationale for monitoring end dates.

In accordance with the *2010 Compliance Monitoring Plan Update* (AECOM 2010a), follow-up groundwater samples were collected from air sparging and HCC system monitoring wells during monthly sampling events, if the NDWTPH-Dx concentrations detected during previous events were above the groundwater RL.

The conditional points of compliance (CPOCs) for groundwater are generally described in Section 3.4 and shown in Figure 6 of the CAP (Ecology 2007). The monitoring network, described above, was established, in part, before the CAP was issued by Ecology in October 2007; however, all wells in the network are inside the groundwater compliance boundary and the locations and designations as interim compliance wells were approved by Ecology in the *2010 Compliance Monitoring Plan Update* (AECOM 2010a). Final compliance boundary wells will be identified in a *Long-Term Compliance Monitoring Plan* to be developed at the conclusion of active remediation pursuant to the CD (Ecology 2007; Exhibit C).

## 3.0 Sampling, Analysis and Reporting

This section summarizes the laboratory analysis and reporting procedures, and the subsequent data management and validation. Groundwater samples collected during the 2010/2011 monitoring period were analyzed by Pace Analytical Laboratories (Pace) in Seattle, Washington. Pace Analytical Laboratories is a Washington State-certified laboratory.

### 3.1 Sampling Methods

The sampling methods used for fluid level gauging and sample collection activities are described in Appendix E of the *2010 Compliance Monitoring Plan* (AECOM 2010). The procedures are for gauging and sampling wells, but these procedures equally apply to piezometer and vault locations.

### 3.2 Analytical Methods

Groundwater samples were analyzed for TPH by Method NWTPH-Dx. Two variations on the method were used: 1) using the silica gel cleanup step to remove organic interferences (TPH-SG), and 2) not using the silica gel cleanup step (TPH).

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 is intended to minimize the occurrence of non-detected results with a reporting limit greater than the cleanup level (CUL).

### 3.3 Data Management and Validation

The analytical laboratory provided both text data reports (PDF files; Appendix B) and electronic data deliverables that can be directly imported into the project environmental data management system.

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.

Upon receipt of data from Pace, 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 GWMP. These metrics included precision, accuracy, method compliance, and completeness of the data set. Validation results were then used to evaluate whether the data were suitable for their intended use.



Validation procedures were based on the criteria provided in:

- USEPA Contract Laboratory Program (CLP) *National Functional Guidelines for Organic Data Review*, document number EPA540/R-99/008, 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 from the USEPA Region I *Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses*, December 1996.

Data validation reports are presented in Appendix B.

## 4.0 Results and Discussion

This section presents a summary and evaluation of results from the 2010/2011 monitoring period.

### 4.1 Fluid Levels

Table 5-1 presents the groundwater elevation, surface water elevation, and product thickness measurements obtained during this reporting period. Groundwater flow direction, variations in groundwater elevations and product thickness, and changes in groundwater gradients in relation to seasonal variations and remediation activities are discussed below.

Quarterly and semi-annual groundwater surface elevation maps (December 2010 to September 2011) are shown in Figures 5-1 through 5-4. As shown in these figures, the groundwater flow direction is consistent, regardless of the season. The groundwater elevations did fluctuate seasonally by 6 feet south of the HCC wall and 3 feet north of the HCC wall. To the south of the HCC wall, groundwater flow is predominantly towards the northwest or west. The HCC wall acts as a barrier to groundwater flow and accentuates a westerly component to flow in the area of the wall. Localized groundwater depressions are present near the HCC gates due to pumping of recovery wells on the south side of the wall. North of the HCC wall, groundwater typically flows towards the northwest in the direction of the Skykomish River.

The groundwater surface elevation maps continue to show that groundwater elevations are lower in the levee remediation area due to the presence of an impermeable liner along the south (up-gradient) margin of the Levee excavation zone. The extent of the liner is shown on the figures and is described in the *Levee Zone Interim Action for Cleanup 2007 – As-Built Completion Report* (ENSR 2007).

### 4.2 Field Parameters

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

#### 4.2.1 pH

The mean pH of groundwater across the site during the reporting period was 5.88. The minimum pH was 3.91 at 2B-W-4 on June 11, 2011, and the maximum pH was 7.34 at 5-W-17 on September 21, 2011. The median, minimum, and maximum pH measurements were consistent with past measurements at the site.

#### 4.2.2 Conductivity

The mean conductivity (in micromhos per centimeter [ $\mu\text{mhos/cm}$ ]) of groundwater across the site during the reporting period was 95. The minimum was 32 at EW-2A on June 21, 2011 and at 2A-W-40 on September 20, 2011, and the maximum was 461 at 5-W-56 on September 21, 2011. These measurements were consistent with historical values.

### 4.2.3 Temperature

The mean temperature (°C) of groundwater during the reporting period was 9.09. The minimum temperature was 3.21 at 5-W-56 on March 23, 2011, and the maximum temperature was 20.34 at 1C-W-8 on July 28, 2011. The temperature varied seasonally.

### 4.2.4 Dissolved Oxygen

The mean dissolved oxygen (DO) concentration (mg/L) in groundwater across the site during the reporting period was 3.63. DO ranged from 0.21 at 5-W-54 on September 21, 2011 to a maximum of 10.85 measured at MW-16 on March 22, 2011. DO was not measured at 1C-W-1 during the January 2011 sampling event due to a DO sensor malfunction. In general, wells outside the areas of known contamination had higher concentrations of DO than wells within the dissolved plume area. The lowest concentrations of DO were typically measured in areas within and downgradient from the areas of known soil contamination and in areas having higher concentrations of groundwater contamination. These measurements are consistent with historical values.

### 4.2.5 Oxidation-Reduction Potential

The mean oxidation-reduction potential (ORP in mV) in groundwater across the site during the reporting period was 165.9. The minimum ORP value was -120.4 at GW-2 on September 21, 2011; and the maximum was 529 at GW-3 on June 21, 2011. ORP in groundwater at the site is most commonly positive. These measurements were consistent with historical values.

### 4.2.6 Turbidity

The mean turbidity (NTU) in groundwater across the site during the reporting period was 5.65. Turbidity ranged from non-detect (0.00), to a maximum of 218 measured at 1C-W-3 on September 20, 2011. There was one anomalous measurement during the 2010/2011 monitoring period. This anomaly was not used in factoring the mean (675 at MW-3 on September 19, 2011). Turbidity measurements were generally less than 10 (90% of the recorded values) during the reporting period and are consistent with historical measurements.

## 4.3 Total Petroleum Hydrocarbons

### 4.3.1 Applicable 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 (Ecology 2007). The CAP anticipates that cleanup levels will be attained at points of compliance following implementation of all cleanup actions specified in the CAP and submittal of the Long-Term Compliance Monitoring Plan (CAP, Sections 4 and 6.2.).

### 4.3.2 Analytical Results

TPH in groundwater was analyzed using Northwest Method NWTPH-Dx without silica gel cleanup (all samples) and with silica gel cleanup (selected samples collected mainly from the Levee Zone). NWTPH-Dx measures diesel-range (TPH-D) and oil-range (TPH-O) hydrocarbons.

Diesel- and oil-range hydrocarbon fractions were added together to determine the total TPH (calc) and TPH-SG (calc). If either the diesel or the oil TPH fraction was not detected, then half of the MDL value was used to represent the non-detected component in the calculation. If both components were not detected, then half the MDL of both components were added to represent the TPH calculated value. The value then is followed by the qualifier (ND). Figures 5-5 through 5-8 show the extent of TPH (calc) and TPH-SG (calc) concentrations detected in groundwater samples during the quarterly and semi-

annual groundwater monitoring events. Table 5-3 presents all groundwater TPH data collected during the reporting period.

TPH (calc) and TPH-SG (calc) concentrations were compared to the CUL (208 µg/L) and RL (477 µg/L). As described in the CAP, the CUL for TPH in groundwater is intended to protect sediments from recontamination by groundwater (e.g., near the South Fork Skykomish River and Former Maloney Creek) and the RL for TPH in groundwater is intended to protect drinking water. The approximate CPOC boundary shown on Figures 5-5 through 5-8 was taken from CAP Figure 6 (Ecology 2007). As described in the CAP, it is anticipated that groundwater CULs will not be achieved until all cleanup work has been completed.

The data are presented below in zones by quarter excluding the schoolyard zone data which is collected only during the semi-annual event. All data (all zones) collected during semi-annual events are presented in the semi-annual groundwater monitoring results section.

#### 4.3.3 Semi-Annual Site-Wide Groundwater Monitoring Results

Groundwater samples were collected from site-wide monitoring locations during the semi-annual groundwater monitoring events in March and September 2011. Groundwater samples from all sampling locations, as shown on Table 2-3, were analyzed for the presence of TPH. TPH results from these semi-annual events are displayed on Figures 5-5 and 5-7 and in Tables 5-3 and 5-4.

During the March 21 to 23, 2011, semi-annual groundwater monitoring event, 43 groundwater samples were collected from 38 monitoring locations from around the site during this reporting period and analyzed for TPH by NWTPH-Dx without silica gel cleanup. TPH was detected in 31 of the 43 samples. TPH (calc) concentrations in the samples with detected TPH ranged from 23.55 to 18,700 µg/L. Of the 31 samples with detected TPH, 6 had TPH (calc) concentrations exceeding the RL (477 µg/L), with concentrations ranging from 500 to 18,700 µg/L. The RL exceedances were detected in samples from the following six locations: 2A-W-9, 2A-W-10, 5-W-15, 5-W-50, 5-W-51, and 5-W-56. The RL exceedances occurred in wells located primarily within or adjacent to the residual LNAPL plumes. The only exceptions are 2A-W-9 and 5-W-15, which are near LNAPL areas (Figure 5-6); 2A-W-9 is located within the railyard boundary and 5-W-15 is adjacent to the School. Trace LNAPL was observed in samples collected from location 5-W-51, which had TPH (calc) concentrations exceeding the RL.

During the March 2011 groundwater monitoring event, nine groundwater samples collected from eight Levee Zone monitoring locations, were analyzed for TPH-SG by NWTPH-Dx. TPH was detected in two of the nine samples (at wells 5-W-15 and 5-W-18). TPH-SG (calc) concentrations in the samples with detected TPH ranged from 40.5 to 41 µg/L. The TPH concentrations of the two samples were below the RL (477 µg/L).

During the September 19 to 21, 2011, semi-annual groundwater monitoring event, 41 groundwater samples were collected from 38 monitoring locations and analyzed for TPH by NWTPH-Dx without silica gel cleanup. TPH was detected in 26 of the 41 samples. TPH (calc) concentrations in the samples with detected TPH ranged from 43.5 to 4,200 µg/L. Of the 26 samples with detected TPH, 6 had TPH (calc) concentrations exceeding the RL (477 µg/L) with concentrations ranging from 500 to 4,200 µg/L. The RL exceedances were detected at the following 6 locations: 2A-W-9, 2A-W-10, 5-W-50, 5-W-51, 5-W-55, and 5-W-56. Two-thirds of the RL exceedances occurred in wells located within or adjacent to the LNAPL plume beneath the School (Figure 5-8). Trace product was observed in the sample collected from location 5-W-51, which had TPH (calc) concentrations exceeding the RL.

During the September 2011 groundwater monitoring event seven groundwater samples, collected from six Levee Zone monitoring locations, were also analyzed for TPH-SG by NWTPH-Dx. TPH-SG was

detected in two of the seven samples (at wells 5-W-15 and 5-W-18). TPH-SG (calc) concentrations ranged from 65.5 to 90.5 µg/L. All detected TPH SG (calc) concentrations were below the RL (477 µg/L; Figure 5-8).

#### 4.3.3.1 Schoolyard Perimeter

Groundwater samples were collected from monitoring locations around the perimeter of the schoolyard (5-W-50, 5-W-51, 5-W-54, 5-W-55, and 5-W-56) during the semi-annual groundwater monitoring events in March and September 2011. TPH results from these semi-annual events are displayed on Figures 5-6 and 5-8. A total of 11 groundwater samples were collected from these five monitoring locations and analyzed for TPH by NWTPH-Dx without silica gel cleanup. TPH was detected in all 11 samples. TPH (calc) concentrations in the samples with detected TPH ranged from 26.85 to 18,700 µg/L. In those 11 samples with detected TPH, seven had TPH (calc) concentrations exceeding the RL (477 µg/L), with concentrations ranging from 500 to 18,700 µg/L. The RL exceedances were detected in samples from all schoolyard perimeter wells, with the exception of 5-W-54. Trace product was observed in both samples collected from 5-W-51, one of which had the highest observed TPH (calc) concentration (18,700 µg/L).

#### 4.3.4 Air Sparging System Monitoring

Groundwater samples were collected from air sparging system monitoring locations (1C-W-1, 1C-W-7, and 1C-W-8) on a monthly basis throughout the reporting period. TPH results from these events are displayed on Figures 5-5 to 5-8 (for the quarterly and semiannual sampling events) and in Tables 5-3 and 5-4. Forty-four groundwater samples were collected from these three locations during this reporting period and analyzed for TPH by NWTPH-Dx without silica gel cleanup. TPH was detected in 43 of the 44 samples. TPH (calc) concentrations in the samples with detected TPH ranged from 40.55 to 3,040 µg/L. Of the 43 samples with detected TPH, 5 had TPH (calc) concentrations exceeding the RL (477 µg/L), with concentrations ranging from 500 to 3,040 µg/L. The RL exceedances were detected in samples from wells 1C-W-7 and 1C-W-8, which are located up gradient of and within the sparging area, respectively. Air sparging system well monitoring results are described further and evaluated in the *2011 Annual Air Sparging System Operations Report* (AECOM 2012a).

#### 4.3.5 Hydraulic Control and Containment System

The following sections summarize groundwater analytical results from wells that monitor the HCC system and adjacent areas. Quarterly monitoring was completed in December 2010, and March, June, and September 2011 for the HCC system monitoring locations in the backfill and downgradient of the HCC, and for the HCC system performance monitoring end wells and gate wells. If a sample location result exceeded the RL (477 µg/L) then the location was sampled the following month until the TPH (calc) concentration was below the RL (477 µg/L). TPH results from these events are displayed on Figures 5-5 to 5-8 and in Tables 5-3 and 5-4. All results from the HCC well monitoring events are described further and evaluated in the *Draft 2011 Annual Hydraulic Control and Containment System Operations Report* (AECOM, 2012b).

##### 4.3.5.1 Backfill and Downgradient of the HCC

Groundwater samples were collected quarterly from monitoring locations within the clean backfill emplaced during the HCC wall construction and downgradient of the HCC wall (1B-W-23, 1C-W-7, 2A-W-40, 2A-W-41, 2A-W-42, and 5-W-43). An exception to this was well 1C-W-7, which is sampled monthly because it is also used to monitor the air sparging system. A total of 38 groundwater samples were collected throughout the reporting period from these six backfill/ downgradient locations and analyzed for TPH by NWTPH-Dx without silica gel cleanup. TPH was detected in 28 of the 38 samples. TPH (calc) concentrations in the samples with detected TPH ranged from 23.55 to 790 µg/L. Of the

28 samples with detected TPH, 1 had TPH (calc) concentrations exceeding the RL (477 µg/L), with a concentration of 790 µg/L. The RL exceedance was detected in a sample from location 1C-W-7 in December 2010. This well is located in the clean backfill on the north side of the HCC wall. As described in *2011 Annual Hydraulic Control and Containment System Operations Report* (AECOM, 2012b), Section 3.3.7, the high concentrations in 1C-W-7 are likely due to downgradient impacted soil and groundwater being remediated by the air sparging system. The TPH concentrations in upgradient GW-4 samples collected in December 2010 was 69.7, µg/L, which indicates that the 1C-W-7 concentrations were not due to impacted groundwater flowing through the nearest upgradient HCC gate. TPH concentrations in monthly groundwater samples collected from 1C-W-7 after December 2010 were equal to or less than 156 µg/L.

#### 4.3.5.2 HCC System Performance

##### End Wells

Groundwater samples were collected quarterly from EW-1 and EW-2A (starting in June 2011), located at the west and east ends of the HCC wall, respectively, throughout the reporting period. The samples were analyzed for TPH by NWTPH-Dx without silica gel cleanup. TPH was detected in three of the four samples collected from EW-1; however, all results were below the RL (477 µg/L). TPH was not detected in EW-2A.

##### Gate Wells

Groundwater samples were collected quarterly from the four gate wells (GW-1 to GW-4) during the reporting period. A total of 19 groundwater samples were collected from these four locations during the reporting period and analyzed for TPH by NWTPH-Dx without silica gel cleanup. TPH was detected in 16 of the 19 samples. TPH (calc) concentrations in the samples with detected TPH ranged from 30.55 to 107.5 µg/L. All samples with detected TPH were below the RL (477 µg/L).

##### Gate Sentry Wells

Groundwater samples were collected from the gate sentry wells following the May 2011 system shutdown, which lasted longer than 48 hours and during the semi-annual monitoring events in March and September 2011. These locations are intended to monitor TPH concentrations in the reactive material in each gate to evaluate treatment capacity and exhaustion rates. TPH in groundwater collected from these locations is removed by the reactive media; therefore, these results are not representative of site groundwater conditions and are not evaluated in this report. The groundwater results for the semi-annual events are presented in Table 5-3 for reference, but are not presented on the report figures.

#### 4.3.6 Levee Zone

Groundwater samples were collected quarterly from Levee Zone monitoring locations (5-W-14 to 5-W-19) during the December 2010, and March, June, and September 2011 events. In December 2010 and March 2011 samples were collected from wells 5-W-20 and 5-W-42, prior to abandonment in May 2011. TPH results from these events are displayed on Figures 5-5 to 5-8. Thirty-two groundwater samples were collected from eight Levee Zone monitoring locations throughout the reporting period and analyzed for TPH by NWTPH-Dx with and without silica gel cleanup. TPH was detected in 16 of the 32 samples; TPH-SG was detected in 10 of the 32 samples. TPH (calc) concentrations in the samples with detected TPH ranged from 31.65 to 830 µg/L. TPH-SG (calc) concentrations in the samples with detected TPH ranged from 40 to 90.5 µg/L. Of the 16 samples with detected TPH, 3 had TPH (calc) concentrations exceeding the RL (477 µg/L), with concentrations ranging from 570 to 830 µg/L. The TPH (calc) RL exceedances were detected in samples from well 5-W-15. All samples with detected TPH-SG had a TPH-SG (calc) concentration below the RL. Well 5-W-15 which exhibited TPH

(calc) RL exceedances, is located within the 2006 interim cleanup action area and adjacent to the school and observed NAPL.

#### **4.3.7 Former Maloney Creek Zone – East Wetland and Surrounding Area**

Groundwater samples were collected quarterly from monitoring locations surrounding the FMCZ-EW (2A-W-9, 2A-W-10, 2B-W-4, MW-3, and MW-4) during the quarterly December 2010, March, June and September 2011 events. TPH results from these events are displayed on Figures 5-5 and 5-8. Twenty-two groundwater samples were collected throughout the reporting period from these five monitoring locations and analyzed for TPH by NWTPH-Dx without silica gel cleanup. TPH was detected in 19 of the 23 samples. TPH (calc) concentrations in the samples with detected TPH ranged from 48.5 to 1,100 µg/L. Of the 19 samples with detected TPH, 6 had TPH (calc) concentrations exceeding the RL (477 µg/L), with concentrations ranging from 500 to 1,100 µg/L. The RL exceedances were detected in samples from the following two locations 2A-W-9 and 2A-W-10.

## 5.0 Summary and Recommendations

This report presents the results of groundwater monitoring performed from October 26, 2010 to September 21, 2011. The fluid level and analytical 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 gradients observed during the previous monitoring periods.

2011 marked the completion of major excavation work in Skykomish. Site wide TPH data collected during the 2011 monitoring period indicate that the overall extent of the LNAPL and dissolved plumes remained relatively stable. 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 LNAPL and residual product. Of the total 60 wells sampled, 43 wells had at least one TPH detection; of these detections, only 8 wells exceeded the RL. The data do not indicate significant migration of NAPL or changes in TPH concentrations. Future monitoring in 2012 and beyond will develop the groundwater quality characterization needed to determine post-cleanup conditions at the points of compliance.

Groundwater monitoring will continue pursuant to the 2010 *Groundwater Monitoring Plan* and the 2010 *Compliance Monitoring Plan Update* (AECOM 2010a). Pending completion of all cleanup actions specified in the CAP, groundwater monitoring will be continued in accordance with the *Long-term Compliance Monitoring Plan*, which will be submitted in accordance with Exhibit C to the CD.



## 6.0 References

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**Table 2-1 Modifications to the Groundwater Monitoring Network**

Activity	Activity Date	Location ID	Location Type	Location Monitoring Function	Rationale for Abandoned, Destroyed, Deferred, Canceled, or Not Installed Locations	Reference for Planned Activity <sup>a</sup>	Reference for Completed Activity <sup>a</sup>
Abandoned	5/26/2011	MW-28	Monitoring Well	Site-wide	Located within 2011 excavation extent	Specifications - NWDZ Remediation (AECOM 2009d)	2010 AS-Built Completion Report (AECOM, in progress)
Abandoned	5/26/2011	5-W-20	Monitoring Well	Levee Zone	Located within 2011 excavation extent	Specifications - NWDZ Remediation (AECOM 2009d)	2010 AS-Built Completion Report (AECOM, in progress)
Abandoned	5/26/2011	5-W-42	Monitoring Well	Levee Zone	Located within 2011 excavation extent	Specifications - NWDZ Remediation (AECOM 2009d)	2010 AS-Built Completion Report (AECOM, in progress)
Installed	5/26/2011	EW-2A	HCC End Well	HCC System	—	Specifications - 2010 Remediation (AECOM 2010b)	2010 AS-Built Completion Report (AECOM, in progress)
Deferred	NA	5-W-44	Monitoring Well	Downgradient of the HCC	2009, 2010, 2011 excavation activities	2009 Compliance Monitoring Plan Update, Appendix E (AECOM 2009a)	NA
Deferred	NA	1A-W-38	Monitoring Well	Site-wide	2010 and 2011 excavation activities	2009 Compliance Monitoring Plan Update, Appendix E (AECOM 2009a)	NA

**Notes:**

<sup>a</sup> Complete references are presented in Section 7.0 of the report.

HCC = Hydraulic Control and Containment

FMCZ - EW = Former Maloney Creek Zone - East Wetland

FMCZ - WW = Former Maloney Creek Zone - West Wetland

— = Not Applicable

**Table 2-2 Groundwater Monitoring Event Dates**

Event	Start Date	End Date
Air Sparge System Monthly Groundwater Sampling Event	10/26/2010	10/26/2010
Air Sparge System Monthly Groundwater Sampling Event	11/30/2010	11/30/2010
Quarterly Fluid Gauging Event	12/14/2010	12/14/2010
Quarterly Groundwater Sampling Event	12/14/2010	12/16/2010
Air Sparge System Monthly Groundwater Sampling Event	1/26/2011	1/26/2011
Air Sparge System Monthly Groundwater Sampling Event	2/21/2011	2/21/2011
Semi-Annual Fluid Gauging Event	3/21/2011	3/21/2011
Semi-Annual Groundwater Sampling Event	3/21/2011	3/23/2011
Air Sparge System Monthly Groundwater Sampling Event	4/27/2011	4/27/2011
Air Sparge System Monthly Groundwater Sampling Event	5/26/2011	5/26/2011
Quarterly Fluid Gauging Event	6/21/2011	6/21/2011
Quarterly Groundwater Sampling Event	6/21/2011	6/22/2011
Air Sparge System Monthly and Compliance Groundwater Sampling Event	7/28/2011	7/28/2011
Air Sparge System Monthly and Compliance Groundwater Sampling Event	8/30/2011	8/30/2011
Semi-Annual Fluid Gauging Event	9/19/2011	9/19/2011
Semi-Annual Groundwater Sampling Event	9/19/2011	9/22/2011

**Note:**

Sampling details for each monitoring event are included in Table 2-3.

Table 2-3 Groundwater Sampling Event Details

Site Area	Location ID	Groundwater Sampling Events					Analyte
		Quarterly (12/14/10 to 12/16/10)	Semi-Annual (3/21/11 to 3/23/11)	Quarterly (6/21/11 to 6/22/11)	Semi-Annual (9/19/11 to 9/21/11)	Monthly Sampling Event(s)	
Air Sparging System	1C-W-7*	X	X	X	X	X	NWTPH-Dx
	1C-W-8	X	X	X	X	X	NWTPH-Dx
	1C-W-1	X	X	X	X	X	NWTPH-Dx
Backfill and Downgradient of the HCC	1B-W-23	X	X	X	X	—	NWTPH-Dx
	1C-W-7*	X	X	X	X	—	NWTPH-Dx
	2A-W-40	X	X	X	X	—	NWTPH-Dx
	2A-W-41	X	X	X	X	—	NWTPH-Dx
	2A-W-42	X	X	X	X	—	NWTPH-Dx
	5-W-43	X	X	X	X	—	NWTPH-Dx
	5-W-44	Not Installed					NWTPH-Dx
Former Maloney Creek Zone – East Wetland and Surrounding Areas	2A-W-10	—	X	—	X	—	NWTPH-Dx
	2A-W-9	—	X	—	X	—	NWTPH-Dx
	2B-W-4	—	X	—	X	—	NWTPH-Dx
	MW-3	—	X	—	X	—	NWTPH-Dx
	MW-4	—	X	—	X	—	NWTPH-Dx
HCC System	EW-1	X	X	X	X	—	NWTPH-Dx
	EW-2A	Installed 05/26/2011		X	X	—	NWTPH-Dx
	GW-1	X	X	X	X	—	NWTPH-Dx
	GW-2	X	X	X	X	—	NWTPH-Dx
	GW-3	X	X	X	X	—	NWTPH-Dx
	GW-4	X	X	X	X	—	NWTPH-Dx
	S1-AD	—	X	—	X	—	NWTPH-Dx
	S1-AU	—	X	—	X	—	NWTPH-Dx
	S1-BD	—	X	—	X	—	NWTPH-Dx
	S1-BU	—	X	—	X	—	NWTPH-Dx
	S2-AD	—	X	—	X	—	NWTPH-Dx
	S2-AU	—	X	—	X	—	NWTPH-Dx
	S2-BD	—	X	—	X	—	NWTPH-Dx
	S2-BU	—	X	—	X	—	NWTPH-Dx
	S3-AD	—	X	—	X	—	NWTPH-Dx
	S3-AU	—	X	—	X	—	NWTPH-Dx
	S3-BD	—	X	—	X	—	NWTPH-Dx
	S3-BU	—	X	—	X	—	NWTPH-Dx
	S3-CD	—	X	—	X	—	NWTPH-Dx
	S3-CU	—	X	—	X	—	NWTPH-Dx
	S4-AD	—	X	—	X	—	NWTPH-Dx
	S4-AU	—	X	—	X	—	NWTPH-Dx
	S4-BD	—	X	—	X	—	NWTPH-Dx
	S4-BU	—	X	—	X	—	NWTPH-Dx
	S4-CD	—	X	—	X	—	NWTPH-Dx
	S4-CU	—	X	—	X	—	NWTPH-Dx
Levee Zone	5-W-14	X	X	X	X	—	NWTPH-Dx
	5-W-15	X	X	X	X	—	NWTPH-Dx
	5-W-16	X	X	X	X	—	NWTPH-Dx
	5-W-17	X	X	X	X	—	NWTPH-Dx
	5-W-18	X	X	X	X	—	NWTPH-Dx
	5-W-19	X	X	X	X	—	NWTPH-Dx
	5-W-20	X	X	Abandoned 5/26/11		—	NWTPH-Dx
	5-W-42	X	X	Abandoned 5/26/11		—	NWTPH-Dx
Schoolyard Perimeter Zone	5-W-50	—	X	—	X	—	NWTPH-Dx
	5-W-51	—	X	—	X	—	NWTPH-Dx
	5-W-54	—	X	—	X	—	NWTPH-Dx
	5-W-55	—	X	—	X	—	NWTPH-Dx
	5-W-56	—	X	—	X	—	NWTPH-Dx
Site-Wide**	1A-W-4	—	X	—	X	—	NWTPH-Dx
	1B-W-2	—	X	—	X	—	NWTPH-Dx
	1B-W-3	—	X	—	X	—	NWTPH-Dx
	1C-W-3	—	X	—	X	—	NWTPH-Dx
	1C-W-4	—	X	—	X	—	NWTPH-Dx
	MW-16	—	X	—	X	—	NWTPH-Dx
	MW-38R	—	X	—	X	—	NWTPH-Dx

**Notes:**

Sample analyzed for NWTPH-Dx with and without silica gel cleanup. All other locations analyzed without silica gel cleanup.

Where the sampling frequency differs from the planned frequency presented in the 2010 *Groundwater Monitoring Plan* (AECOM 2010a), a rationale is provided.

\* Location is being monitored for multiple assessments.

\*\* Location is being monitored for the site-wide assessment only. Locations sampled semi-annually from all site areas are included in the site-wide assessment, except HCC gate vault sentry wells.

— = Not sampled

HCC = Hydraulic Control and Containment

TPH = Total Petroleum Hydrocarbons

Table 2-4 Fluid Gauging Events Summary

Area	Well	Gauging Monitoring Frequency				Well Installation Date <sup>b</sup>	Well Abandonment/ Destruction Date
		Continuous <sup>a</sup>	Monthly	Quarterly	Semi-annual		
Air Sparging System	1C-W-1		X			NA	NA
	1C-W-7 <sup>c</sup>		X			NA	NA
	1C-W-8		X			NA	NA
Backfill and Downgradient of the HCC	1B-W-23			X		NA	NA
	1C-W-7 <sup>c</sup>			X		NA	NA
	2A-W-40			X		NA	NA
	2A-W-41			X		NA	NA
	2A-W-42			X		NA	NA
	5-W-43			X		NA	NA
	5-W-44	Not Installed				NA	NA
Former Maloney Creek Zone – East Wetland and Surrounding Areas	2A-W-10			X		NA	NA
	2A-W-3			X		NA	NA
	2A-W-4			X		NA	NA
	2A-W-5			X		NA	NA
	2A-W-7			X		NA	NA
	2A-W-9			X		NA	NA
	2B-W-4			X		NA	NA
	MW-1			X		NA	NA
	MW-10			X		NA	NA
	MW-11			X		NA	NA
	MW-13			X		NA	NA
	MW-14			X		NA	NA
	MW-15			X		NA	NA
	MW-18			X		NA	NA
	MW-2			X		NA	NA
	MW-3			X		NA	NA
	MW-4			X		NA	NA
	MW-40			X		NA	NA
	MW-5			X		NA	NA
	MW-7			X		NA	NA
	MW-28			X		NA	5/26/2011
	MW-9			X		NA	NA
HCC System	CV (S3)			X		NA	NA
	EV (S4)			X		NA	NA
	EW-1			X		NA	NA
	EW-2A			X		5/26/2011	NA
	FWV (S1)			X		NA	NA
	GW-1			X		NA	NA
	GW-2			X		NA	NA
	GW-3			X		NA	NA
	GW-4			X		NA	NA
	IW-01			NM		NA	NA
	IW-02			NM		NA	NA
	PZ-1A	X				NA	NA
	PZ-2N	X				NA	NA
	PZ-2S	X				NA	NA
	PZ-3N	X				NA	NA
	PZ-3S	X				NA	NA
	PZ-4N	X				NA	NA
	PZ-4S	X				NA	NA
	PZ-5N	X				NA	NA
	PZ-5S	X				NA	NA
	PZ-6N	X				NA	NA
	PZ-6S	X				NA	NA
	PZ-7N	X				NA	NA
	PZ-7S	X				NA	NA
	PZ-8	X				NA	NA
	RW-01			X		NA	NA
	RW-02			X		NA	NA
	RW-03			X		NA	NA
	RW-04			X		NA	NA
	RW-05			X		NA	NA
	RW-06			X		NA	NA
	RW-07			X		NA	NA
	RW-08			X		NA	NA
	RW-09			X		NA	NA
	WV (S2)	X				NA	NA
Levee Zone	5-W-14			X		NA	NA
	5-W-15			X		NA	NA
	5-W-16			X		NA	NA
	5-W-17			X		NA	NA
	5-W-18			X		NA	NA
	5-W-19			X		NA	NA
	5-W-20			X		NA	5/26/2011
Schoolyard Perimeter Zone	5-W-42			X		NA	5/26/2011
	5-W-50				X	NA	NA
	5-W-51				X	NA	NA
	5-W-54				X	NA	NA
	5-W-55				X	NA	NA
Site-Wide <sup>d</sup>	5-W-56				X	NA	NA
	1A-W-4				X	NA	NA
	1B-W-2				X	NA	NA
	1B-W-3				X	NA	NA
	1C-W-3				X	NA	NA
	1C-W-4				X	NA	NA
	2A-W-8			X		NA	NA
	MW-16			X		NA	NA
	MW-28			X		NA	5/26/2011
	MW-32				X	NA	NA
	MW-38R			X		NA	NA

Notes:

- <sup>a</sup> Water level transducers began collecting continuous water level measurements at these locations on August 31, 2009.
- <sup>b</sup> Installation dates for wells installed during the 2009 to 2010 monitoring period.
- <sup>c</sup> Location is being monitored for multiple assessments.
- <sup>d</sup> Location is being monitored for the site-wide assessment only. Locations gauged semi-annually from all site areas are included in the site-wide assessment.
- NM = Not Measured
- HCC = Hydraulic Control and Containment
- TPH = Total Petroleum Hydrocarbons

**Table 5-1 Fluid Level Elevations and Product Thicknesses**

Well Number	12/14/2010		3/21/2011		6/21/2011		9/19/2011	
	GW Elevation (NAVD88)	Product Thickness (feet)	GW Elevation (NAVD88)	Product Thickness (feet)	GW Elevation (NAVD88)	Product Thickness (feet)	GW Elevation (NAVD88)	Product Thickness (feet)
1A-W-4	NM	—	920.31	—	NM	—	919.06	—
1B-W-2	NM	—	921.27	—	NM	—	921.33	—
1B-W-3	NM	—	922.08	—	NM	—	921.40	—
1B-W-23	921.52	—	919.59	—	919.60	—	919.15	—
1C-W-1	925.46	—	923.42	—	923.81	—	922.51	—
1C-W-3	NM	—	923.18	—	NM	—	922.33	—
1C-W-4	NM	—	922.68	—	NM	—	922.15	—
1C-W-7	925.60	—	923.55	—	923.79	—	921.66	—
1C-W-8	925.41	—	923.39	—	923.66	—	922.32	—
2A-W-3	926.93	0.10	924.56	T	924.42	HT	921.57	T
2A-W-4	927.79	None	925.70	HT	925.04	T	921.90	T
2A-W-5	929.73	—	927.53	—	927.24	—	927.53	—
2A-W-7	929.13	—	926.75	—	927.20	—	925.27	—
2A-W-8	932.25	—	928.49	—	929.07	—	926.36	—
2A-W-9	928.83	—	926.80	—	926.51	—	924.23	—
2A-W-10	930.29	—	928.46	—	928.44	—	925.27	—
2A-W-40	923.84	—	921.48	—	922.14	—	920.26	—
2A-W-41	921.51	—	918.74	—	919.59	—	917.34	—
2A-W-42	925.22	—	923.04	—	923.05	—	922.13	—
2B-W-4	930.71	—	928.78	—	929.06	—	926.17	—
5-W-14	920.15	—	917.40	—	918.64	—	917.40	—
5-W-15	918.97	—	917.48	—	918.66	—	917.48	—
5-W-16	919.67	—	917.20	—	918.47	—	917.20	—
5-W-17	919.76	—	917.24	—	918.49	—	917.24	—
5-W-18	919.60	—	917.17	—	918.45	—	917.17	—
5-W-19	918.37	—	916.99	—	918.31	—	916.99	—
5-W-20	919.26	—	916.93	—	Well abandoned on 5/26/2011			
5-W-42	918.83	—	916.89	—	Well abandoned on 5/26/2011			
5-W-43	921.35	—	918.81	—	919.58	—	917.57	—
5-W-50	NM	—	918.63	—	NM	—	918.63	—
5-W-51	NM	—	918.11	T	NM	—	918.11	T
5-W-54	NM	—	918.10	—	NM	—	918.10	—
5-W-55	NM	—	917.65	—	NM	—	917.65	—

**Table 5-1 Fluid Level Elevations and Product Thicknesses**

Well Number	12/14/2010		3/21/2011		6/21/2011		9/19/2011	
	GW Elevation (NAVD88)	Product Thickness (feet)	GW Elevation (NAVD88)	Product Thickness (feet)	GW Elevation (NAVD88)	Product Thickness (feet)	GW Elevation (NAVD88)	Product Thickness (feet)
5-W-56	NM	—	917.74	—	NM	—	917.74	—
MW-1	930.09	—	927.35	—	927.86	—	925.48	—
MW-2	931.21	—	927.85	—	928.51	—	925.85	—
MW-3	932.20	—	930.23	—	930.18	—	926.14	—
MW-4	930.77	—	929.11	—	929.13	—	925.65	—
MW-5	928.84	—	926.82	—	926.51	—	924.21	—
MW-7	927.47	None	925.16	None	924.71	None	922.16	None
MW-9	928.07	—	925.78	—	925.39	—	922.60	—
MW-10	926.90	—	927.02	—	926.77	—	924.22	—
MW-11	929.45	—	927.20	T	927.22	—	924.67	—
MW-13	927.97	—	925.92	—	925.65	—	923.63	—
MW-14	927.57	—	925.53	—	925.20	—	923.09	—
MW-15	926.78	—	924.71	—	924.26	—	921.74	—
MW-16	922.65	—	920.51	—	920.53	—	918.89	—
MW-18	929.77	—	927.33	—	927.28	—	924.70	—
MW-28	930.41	None	927.52	None	Well abandoned on 5/26/2011			
MW-32	NM	—	917.18	—	NM	—	916.11	—
MW-38R	919.97	—	917.96	—	918.35	—	916.83	—
MW-40	927.01	—	924.93	—	924.88	—	922.38	—
CV	NM	—	921.36	—	921.38	—	919.24	—
EV	NM	—	925.39	—	925.67	—	924.21	—
FWV	NM	—	921.50	—	921.54	—	916.50	—
WV	NM	—	919.17	—	919.93	—	920.26	—
EW-1	921.65	—	919.08	—	919.14	—	917.76	—
EW-2A	NM	—	NM	—	NM	—	924.84	—
GW-1	921.66	—	918.79	—	919.65	—	917.30	—
GW-2	921.56	—	918.69	—	919.55	—	917.27	—
GW-3	921.65	—	919.16	—	920.23	—	919.75	—
GW-4	927.64	—	925.32	—	925.56	—	924.20	—
IW-01	NM	—	NM	—	NM	—	NM	—
PW-04	NM	—	925.73	—	NM	—	NM	—
PZ-1R	920.00	—	920.00	—	920.00	—	924.80	—



**Table 5-1 Fluid Level Elevations and Product Thicknesses**

Well Number	12/14/2010		3/21/2011		6/21/2011		9/19/2011	
	GW Elevation (NAVD88)	Product Thickness (feet)	GW Elevation (NAVD88)	Product Thickness (feet)	GW Elevation (NAVD88)	Product Thickness (feet)	GW Elevation (NAVD88)	Product Thickness (feet)
PZ-2N	926.70	—	924.40	—	924.60	—	923.20	—
PZ-2S	928.90	—	926.80	—	926.30	—	923.60	—
PZ-3N	922.10	—	921.30	—	921.20	—	921.10	—
PZ-3S	928.10	—	925.90	—	925.50	—	922.70	—
PZ-4N	921.90	—	921.10	—	921.10	—	921.10	—
PZ-4S	927.50	—	925.10	—	924.70	—	921.60	—
PZ-5N	923.00	—	920.00	—	920.90	—	919.00	—
PZ-5S	924.30	—	923.00	HT	922.70	—	920.50	—
PZ-6N	921.70	—	918.70	—	919.50	—	917.40	—
PZ-6S	925.00	—	923.30	HT	922.80	—	919.50	—
PZ-7N	921.80	—	918.90	—	919.80	—	917.50	—
PZ-7S	925.70	—	923.50	—	923.10	—	919.70	—
PZ-8	922.80	—	920.30	—	920.40	—	918.20	—
RW-02	917.70	—	917.60	—	917.70	—	918.30	—
RW-05	918.50	—	915.80	—	916.30	—	917.20	—
RW-09	NM	—	NM	—	NM	—	NM	—
SK1	NM	—	924.59	—	926.50	—	925.49	—
SK2	NM	—	919.16	—	921.50	—	919.38	—
SK3	NM	—	918.48	—	920.32	—	918.94	—
SK4	NM	—	918.00	—	919.65	—	918.55	—
SK5	NM	—	916.52	—	918.10	—	916.84	—

**Notes:**

GW — Groundwater

T — Trace

HT — Heavy Trace

NM — Not Measured

WW — Wetland Water

 Surface water staff gauge locations

916.40 Surface water elevation

"—" — Not Applicable

**Table 5-2 Stabilized Groundwater 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-4	23-Mar-11	1319	6.36	65	7.2	254.3	6.01	1.00
	21-Sep-11	1530	6.86	51	10.20	80.0	7.02	0.92
1B-W-2	22-Mar-11	1716	5.71	100	7.30	234.2	5.71	0.18
	20-Sep-11	1632	5.60	158	16.29	-89.1	0.44	1.59
1B-W-3	22-Mar-11	1525	6.39	93	6.57	183.1	4.62	2.34
	20-Sep-11	1745	6.49	80	11.06	-94.9	3.58	0.45
1B-W-23	15-Dec-10	1515	6.32	82	7.87	160.1	3.67	2.17
	23-Mar-11	1232	6.33	169	9.26	238.8	9.52	54.3
	22-Jun-11	1157	6.13	71	10.47	115.4	6.10	2.47
	21-Sep-11	1701	6.37	298	14.93	-33.3	6.50	47.5
1C-W-1	26-Oct-10	1054	5.99	80	10.47	412.6	7.63	0.31
	30-Nov-10	1153	6.64	65	8.66	318.6	3.51	0.59
	14-Dec-10	1413	5.29	88	8.90	305.0	6.51	0.76
	26-Jan-11	959	4.85	58	6.50	289.0	NM	0.49
	21-Feb-11	1136	5.34	78	6.31	369.4	6.63	0.52
	22-Mar-11	1017	5.57	59	5.44	26.4	6.67	0.82
	27-Apr-11	1315	5.27	97	7.88	422.5	6.21	0.45
	19-May-11	1048	4.28	72	10.30	348.0	6.19	1.46
	22-Jun-11	914	6.12	44	9.41	105.2	6.27	0.32
	28-Jul-11	1338	4.50	47	10.17	399.8	5.91	0.00
	30-Aug-11	1240	5.29	70	15.87	299.1	4.71	0.57
	20-Sep-11	1017	6.09	51	11.59	-69.5	3.05	0.86
1C-W-3	22-Mar-11	1123	5.96	50	5.36	300.0	7.3	28.6
	20-Sep-11	1159	6.00	51	18.47	-63.8	4.86	218
1C-W-4	22-Mar-11	1325	5.85	57	5.51	280.5	2.31	0.64
	20-Sep-11	1439	5.49	44	10.32	-53.0	2.90	0.47

**Table 5-2 Stabilized Groundwater Field Parameter Measurements**

Well	Sample Date	Field Parameters						
		Time	pH	Conductivity (µmhos/cm)	Temperature (°C)	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)
1C-W-7	26-Oct-10	1244	5.61	84	10.36	250.1	1.87	0.66
	30-Nov-10	1414	6.42	125	7.87	211.9	1.26	1.01
	14-Dec-10	1416	6.34	90	7.82	125.1	4.74	3.41
	26-Jan-11	902	4.35	81	6.20	216.0	1.64	0.61
	21-Feb-11	947	6.27	98	6.61	138.9	1.81	1.42
	22-Mar-11	1433	6.12	87	5.92	165.5	1.38	0.39
	27-Apr-11	1133	5.10	82	7.79	216.9	2.16	4.51
	19-May-11	1233	5.20	79	10.40	284.0	2.33	1.06
	22-Jun-11	1047	6.17	70	10.68	105.3	2.12	0.51
	28-Jul-11	1134	5.91	76	13.22	256.3	2.50	0.00
	30-Aug-11	1424	5.57	88	13.48	439.0	4.68	1.57
	20-Sep-11	15	6.44	62	14.08	-37.0	8.20	0.89
1C-W-8	26-Oct-10	1136	5.58	67	9.70	208.2	3.59	4.14
	30-Nov-10	1238	6.13	77	4.44	267.2	1.22	0.80
	14-Dec-10	1447	5.15	64	6.20	134.0	1.61	2.56
	26-Jan-11	1045	5.03	54	6.10	182.0	1.31	0.88
	21-Feb-11	1048	5.38	48	6.17	127.2	1.54	0.82
	22-Mar-11	938	5.13	63	4.69	285.6	2.28	0.99
	27-Apr-11	1358	5.49	55	8.48	358.0	1.70	2.14
	19-May-11	1122	5.00	115	12.40	233.0	2.04	2.21
	22-Jun-11	952	6.08	56	13.46	109.5	3.10	0.90
	28-Jul-11	1238	5.29	74	20.34	255.7	1.15	0.00
	30-Aug-11	1322	4.80	63	14.90	397.6	1.84	0.80
	20-Sep-11	1107	6.01	57	15.98	-114.4	1.77	0.59
2A-W-9	15-Dec-10	844	5.84	175	7.40	194.0	1.22	1.76
	23-Mar-11	1201	5.93	89	6.9	135.0	1.01	1.75
	22-Jun-11	1502	5.72	41	10.0	110.0	2.02	0.42
	19-Sep-11	1111	6.07	443	12.1	96.0	1.52	5.21
2A-W-10	15-Dec-10	931	5.66	143	3.80	198.0	2.01	1.21
	23-Mar-11	1059	5.50	78	3.50	247.0	1.29	0.30
	22-Jun-11	1524	5.20	70	9.80	98.0	0.94	1.07
	19-Sep-11	1040	4.75	84	11.00	242.0	1.88	65.0

Table 5-2  
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**Table 5-2 Stabilized Groundwater Field Parameter Measurements**

Well	Sample Date	Field Parameters						
		Time	pH	Conductivity (µmhos/cm)	Temperature (°C)	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)
2A-W-40	14-Dec-10	1616	6.62	43	8.82	121	5.85	0.94
	23-Mar-11	1356	6.36	42	6.76	235.1	5.93	0.75
	22-Jun-11	1356	6.37	44	14.32	109.5	7.87	0.6
	20-Sep-11	1426	6.5	32	10.75	76.2	8.15	0.15
2A-W-41	15-Dec-10	1255	6.46	67	7.94	135.4	4.68	2.51
	23-Mar-11	1057	6.04	53	6.87	186.4	5.14	0
	21-Jun-11	1629	5.93	40	10	443	7.11	1.27
	20-Sep-11	1205	6.09	38	9.2	71.9	10.79	0.76
2A-W-42	15-Dec-10	1356	6.14	143	8	156	6.8	1.92
	22-Mar-11	1632	5.93	94	7.3	192.1	1.46	3.01
	21-Jun-11	1534	6.15	85	12.6	112.9	1.54	1.25
	20-Sep-11	1638	6.25	85	11.29	83.7	4.49	2.05
2B-W-4	14-Dec-10	1522	6.02	38	7.15	147.2	8.00	1.23
	21-Mar-11	926	4.19	88	4.4	311	4.77	0.87
	21-Jun-11	1220	3.91	33	9.8	405	5.14	0.37
	19-Sep-11	1309	5.11	116	11.9	293	3.14	4.73
5-W-14	16-Dec-10	944	6.41	53	7.12	171.0	4.75	0.85
	22-Mar-11	913	6.11	53	7.12	52.7	4.42	0.08
	22-Jun-11	918	4.49	69	8.2	301.0	5.89	1.44
	21-Sep-11	905	5.09	238	8.3	335.0	6.4	1.52
5-W-15	16-Dec-10	1034	6.85	233	8.0	-67.7	0.66	37.9
	22-Mar-11	1119	6.80	199	6.78	-40.00	0.66	7.61
	22-Jun-11	1034	6.30	179	10.3	152.0	1.12	3.77
	21-Sep-11	1029	7.23	141	10.1	-54.0	2.01	3.3
5-W-16	16-Dec-10	923	6.47	183	6.8	207.0	3.2	1.59
	22-Mar-11	1013	6.40	73	6.48	33.9	3.20	0.75
	22-Jun-11	1348	6.45	35	8.5	225.0	8.49	1.13
	21-Sep-11	1438	6.89	59	11.2	52.0	7.26	3.59

**Table 5-2 Stabilized Groundwater 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-17	16-Dec-10	836	5.88	63	7.1	252	5.09	0.59
	22-Mar-11	1301	6.25	53	7.21	39.5	3.09	0.72
	22-Jun-11	958	4.85	48	8.80	324.0	6.45	1.51
	21-Sep-11	1336	7.34	109	15.6	-23.0	2.01	1.08
5-W-18	15-Dec-10	1607	6.65	231	6.5	96	4.04	1.69
	22-Mar-11	907	6.40	179	5.30	260.0	1.06	5.26
	22-Jun-11	1310	6.52	148	10.30	-5.1	1.01	0.46
	21-Sep-11	1142	6.89	92	10.5	8.8	2.30	7.31
5-W-19	16-Dec-10	845	6.33	39	6.46	174.8	5.16	0.68
	22-Mar-11	945	5.81	71	6.60	406.0	8.66	0.15
	22-Jun-11	1234	6.12	44	9.00	31.0	7.50	0.10
	21-Sep-11	1106	6.97	43	9.1	-5.5	7.91	3.41
5-W-20	15-Dec-10	1433	6.56	256	6.8	118	1.51	2.83
	22-Mar-11	1052	6.47	146	5.90	225.0	1.33	0.85
	30-Jun-11	Abandoned 5/26/2011						
5-W-42	15-Dec-10	1527	6.41	94	7.90	129.0	3.53	4.46
	22-Mar-11	1134	5.94	57	6.40	427.0	4.99	8.57
	30-Jun-11	Abandoned 5/26/2011						
5-W-43	14-Dec-10	1627	5.52	95	8.20	224.0	2.09	1.44
	21-Mar-11	1358	4.93	63	6.60	283.0	3.09	0.40
	21-Jun-11	1403	5.95	69	8.80	346.0	1.71	2.43
	19-Sep-11	1447	5.12	61	11.10	283.0	2.02	10.50
5-W-50	22-Mar-11	1309	6.55	190	5.80	181.0	1.26	0.80
	21-Sep-11	957	7.02	236	12.70	-13.9	1.94	3.08
5-W-51	22-Mar-11	Product in discharge line. No parameters collected.						
	21-Sep-11							
5-W-54	22-Mar-11	1433	6.36	98	7.33	16.5	1.07	0.00
	21-Sep-11	1506	6.21	109	14.93	-112.7	0.21	0.60
5-W-55	23-Mar-11	1002	5.96	74	5.44	121.6	4.41	0.00
	21-Sep-11	935	5.97	98	14.20	-92.8	0.34	0.68
5-W-56	23-Mar-11	905	6.06	270	3.21	70.1	1.25	7.17
	21-Sep-11	1025	6.14	461	15.59	-109.4	0.41	7.10

Table 5-2  
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**Table 5-2 Stabilized Groundwater Field Parameter Measurements**

Well	Sample Date	Field Parameters						
		Time	pH	Conductivity (µmhos/cm)	Temperature (°C)	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)
EW-1	15-Dec-10	930	5.66	65	6.32	202.6	1.14	0.89
	22-Mar-11	1409	5.94	65	7.20	153.0	1.47	0.14
	22-Jun-11	1503	6.03	60	10.46	125.4	1.47	0.28
	20-Sep-11	1109	6.09	37	9.53	102.1	2.11	0.57
EW-2A	21-Jun-11	1709	5.84	32	9.19	128.8	5.96	0.75
	21-Sep-11	1235	5.48	48	11.31	-55.3	3.89	0.81
GW-1	15-Dec-10	1245	6.11	217	8.00	152.0	2.90	1.72
	21-Mar-11	1439	6.11	93	6.70	116.0	1.50	24.0
	21-Jun-11	1317	5.32	88	9.80	317.0	2.15	12.40
	19-Sep-11	1541	5.78	132	12.10	206.0	0.80	10.75
GW-2	15-Dec-10	1112	6.47	94	8.54	40.1	1.83	8.29
	21-Mar-11	1550	5.95	171	6.10	205.0	2.59	10.60
	21-Jun-11	1440	5.51	78	8.80	240.0	1.03	0.77
	21-Sep-11	1140	6.28	91	11.40	-120.4	0.45	0.62
GW-3	15-Dec-10	1351	6.32	56	7.07	81.1	1.78	2.26
	21-Mar-11	1635	5.36	47	7.40	437.0	7.97	0.54
	21-Jun-11	1539	5.07	42	9.80	529.0	2.25	14.00
	20-Sep-11	1536	6.30	41	8.75	102.5	7.04	45.4
GW-4	15-Dec-10	1611	6.81	156	7.45	142.1	4.10	4.15
	23-Mar-11	848	5.34	140	6.10	365.0	2.93	2.71
	21-Jun-11	1617	6.10	60	9.72	113.3	4.52	1.51
	20-Sep-11	1728	6.42	54	11.21	78.4	1.99	17.40
MW-3	15-Dec-10	1052	5.73	180	4.6	154.0	6.61	0.74
	23-Mar-11	949	5.50	63	4.3	4.5	9.09	1.93
	22-Jun-11	1559	5.93	99	17.0	33.0	4.91	17.70
	19-Sep-11	1352	5.33	83	13.7	214.0	0.89	675

**Table 5-2 Stabilized Groundwater Field Parameter Measurements**

Well	Sample Date	Field Parameters						
		Time	pH	Conductivity (µmhos/cm)	Temperature (°C)	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)
MW-4	15-Dec-10	1009	5.63	66	8.20	215.00	0.87	0.76
	23-Mar-11	1031	5.45	104	3.8	302.0	3.09	0.99
	22-Jun-11	1555	5.83	57	11.0	137.7	0.78	0.54
	19-Sep-11	1001	5.39	151	11.2	277.0	1.63	4.01
MW-16	22-Mar-11	1611	4.57	49	5.70	444.0	10.85	0.44
	21-Sep-11	1601	5.49	58	13.15	-75.1	1.78	0.32
MW-38R	21-Mar-11	1514	5.21	66	7.50	95.0	1.20	0.83
	20-Sep-11	1019	6.18	56	8.40	113.7	2.02	4.73
mean			5.98	73.50	8.52	155.00	2.90	1.04
minimum			3.91	32.00	3.21	-120.40	0.21	0.00
maximum			7.34	461.00	20.34	529.00	10.85	675.00

**Notes:**

\*Potential field error

NM = Not Measured

Table 5-3 Total Petroleum Hydrocarbons (NWTPH-Dx) in Groundwater (µg/L) Analytical Results

Chemical Name			Oil Range				Oil Range with Silica Gel Cleanup				Diesel Range				Diesel Range with Silica Gel Cleanup				TPH (Calc)	TPH Silica Gel (Calc)
Location ID	Sample ID	Sample Date	Result	Q	MDL	MRL	Result	Q	MDL	MRL	Result	Q	MDL	MRL	Result	Q	MDL	MRL		
Site-wide																				
1A-W-4	1A-W-4-0911	9/21/2011	ND		47	95	NA				ND		9.5	19	NA				28.25 (ND)	NA
1A-W-4	1A-W-4-0311	3/23/2011	ND		7.5	100	NA				ND		5	20	NA				6.25 (ND)	NA
1B-W-2	1B-W-2-0311	3/22/2011	ND		7.9	110	NA				49		5.3	21	NA				52.95	NA
1B-W-2	1B-W-2-0911	9/20/2011	ND		47	95	NA				120		9.5	19	NA				143.5	NA
1B-W-3	1B-W-3-0311	3/22/2011	ND		7.3	97	NA				ND		4.9	19	NA				6.1 (ND)	NA
1B-W-3	1B-W-3-0911	9/20/2011	ND		47	95	NA				38		9.5	19	NA				61.5	NA
1C-W-3	1C-W-3-0311	3/22/2011	ND		7.1	94	NA				ND		4.7	19	NA				5.9 (ND)	NA
1C-W-3	1C-W-3-0911	9/20/2011	ND		47	95	NA				33		9.5	19	NA				56.5	NA
1C-W-4	1C-W-4-0311	3/22/2011	210		7.4	99	NA				250		5	20	NA				460	NA
1C-W-4	1C-W-4-0911	9/20/2011	ND		47	95	NA				51		9.5	19	NA				74.5	NA
MW-16	MW-16-0311	3/22/2011	ND		7.1	95	NA				ND		4.7	19	NA				5.9 (ND)	NA
MW-16 (FD)	MW-160-0311	3/22/2011	ND		7.1	95	NA				ND		4.7	19	NA				5.9 (ND)	NA
MW-16	MW-16-0911	9/21/2011	ND		47	94	NA				ND		9.4	19	NA				28.2 (ND)	NA
MW-38R	MW-38R-0311	3/21/2011	ND		7.1	95	NA				47		4.8	19	NA				50.55	NA
MW-38R	MW-38R-0911	9/20/2011	ND		50	99	NA				63		9.9	20	NA				88	NA
Maximum			210				NA				250				NA				460	
Minimum			ND				NA				ND				NA				ND	
Average																			123**	recalc
Air Sparging System																				
1C-W-1	1C-W-1-1010	10/26/2010	ND		7.1	94	NA				37		4.7	19	NA				40.55	NA
1C-W-1	1C-W-1-1110	11/30/2010	ND	J	7.1	94	NA				44	J	4.7	19	NA				47.55	NA
1C-W-1	1C-W-1-1210	12/14/2010	ND		7.1	95	NA				42		4.7	19	NA				45.55	NA
1C-W-1	1C-W-1-0111	1/26/2011	ND		7.1	95	NA				43		4.7	19	NA				46.55	NA
1C-W-1	1C-W-1-0211	2/21/2011	ND		7.4	98	NA				69		4.9	20	NA				72.7	NA
1C-W-1 (FD)	1C-W-100-0211	2/21/2011	ND		7.2	96	NA				76		4.8	19	NA				79.6	NA
1C-W-1	1C-W-1-0311	3/22/2011	ND		7.3	97	NA				55		4.9	19	NA				58.65	NA
1C-W-1	1C-W-1-0411	4/27/2011	ND		7.7	100	NA				48		5.2	21	NA				51.85	NA
1C-W-1	1C-W-1-0511	5/19/2011	ND		47	95	NA				19		9.5	19	NA				42.5	NA
1C-W-1	1C-W-1-0611	6/22/2011	ND		47	94	NA				25		9.4	19	NA				48.5	NA
1C-W-1	1C-W-1-0711	7/28/2011	ND		190	390	NA				ND		39	78	NA				114.5 (ND)	NA
1C-W-1	1C-W-1-0811	8/30/2011	ND		47	95	NA				23		9.5	19	NA				46.5	NA
1C-W-1	1C-W-1-0911	9/20/2011	ND		47	95	NA				38		9.5	19	NA				61.5	NA
1C-W-7*	1C-W-7-1010	10/26/2010	ND		7.1	94	NA				99		4.7	19	NA				102.55	NA
1C-W-7*	1C-W-7-1110	11/30/2010	ND		7.1	94	NA				98		4.7	19	NA				101.55	NA
1C-W-7*	1C-W-7-1210	12/14/2010	130		7.4	99	NA				660		5	20	NA				790	NA
1C-W-7*	1C-W-7-0111	1/26/2011	ND		7.1	95	NA				82		4.7	19	NA				85.55	NA
1C-W-7* (FD)	1C-W-70-0111	1/26/2011	ND		7.1	95	NA				67		4.7	19	NA				70.55	NA
1C-W-7*	1C-W-7-0211	2/21/2011	ND		7.4	98	NA				89		4.9	20	NA				92.7	NA
1C-W-7*	1C-W-7-0311	3/22/2011	ND		7.3	97	NA				51		4.9	19	NA				54.65	NA
1C-W-7*	1C-W-7-0411	4/27/2011	ND		7.3	97	NA				60		4.9	19	NA				63.65	NA
1C-W-7* (FD)	1C-W-70-0411	4/27/2011	ND		7.1	95	NA				70		4.8	19	NA				73.55	NA
1C-W-7*	1C-W-7-0511	5/19/2011	ND		47	95	NA				86		9.5	19	NA				109.5	NA
1C-W-7* (FD)	1C-W-70-0511	5/19/2011	ND		47	95	NA				72		9.5	19	NA				95.5	NA
1C-W-7*	1C-W-7-0611	6/22/2011	ND		47	94	NA				66		9.4	19	NA				89.5	NA
1C-W-7*	1C-W-7-0711	7/28/2011	ND		190	380	NA				61		38	76	NA				156	NA
1C-W-7*	1C-W-7-0811	8/30/2011	ND		47	95	NA				30		9.5	19	NA				53.5	NA
1C-W-7*	1C-W-7-0911	9/20/2011	ND		47	95	NA				39		9.5	19	NA				62.5	NA
1C-W-8	1C-W-8-1010	10/26/2010	840		7.1	94	NA				2200		4.7	19	NA				3040	NA
1C-W-8 (FD)	1C-W-80-1010	10/26/2010	830		7.1	94	NA				2100		4.7	19	NA				2930	NA
1C-W-8	1C-W-8-1110	11/30/2010	130		7.1	94	NA				280		4.7	19	NA				410	NA
1C-W-8 (FD)	1C-W-80-1110	11/30/2010	140		7.1	94	NA				260		4.7	19	NA				400	NA
1C-W-8	1C-W-8-1210	12/14/2010	190		7.1	95	NA				420		4.8	19	NA				610	NA
1C-W-8	1C-W-8-0111	1/26/2011	120		7.1	95	NA				310		4.7	19	NA				430	NA
1C-W-8	1C-W-8-0211	2/21/2011	150		7.1	94	NA				320		4.7	19	NA				470	NA
1C-W-8	1C-W-8-0311	3/22/2011	120		7.1	95	NA				250		4.7	19	NA				370	NA
1C-W-8	1C-W-8-0411	4/27/2011	130		7.7	100	NA				370		5.2	21	NA				500	NA
1C-W-8	1C-W-8-0511	5/19/2011	110		47	95	NA				240		9.5	19	NA				350	NA
1C-W-8	1C-W-8-0611	6/22/2011	ND		47	94	NA				150		9.4	19	NA				173.5	NA
1C-W-8	1C-W-8-0711	7/28/2011	ND		190	380	NA				140		38	76	NA				235	NA
1C-W-8 (FD)	1C-W-80-0711	7/28/2011	ND		190	380	NA				160		38	76	NA				255	NA
1C-W-8	1C-W-8-0811	8/30/2011	ND		47	95	NA				140		9.5	19	NA				163.5	NA
1C-W-8 (FD)	1C-W-80-0811	8/30/2011	ND		47	95	NA				120		9.5	19	NA				143.5	NA
1C-W-8	1C-W-8-0911	9/20/2011	ND		47	95	NA				150		9.5	19	NA				173.5	NA
Maximum			840				NA				2200				NA				3040	
Minimum			ND				NA				ND				NA				ND	
Average																			377**	
Hydraulic Control and Containment System																				
EW-1	EW-1-1210	12/15/2010	ND		7.5	100	NA				46		5	20	NA				49.75	NA
GW-1	GW-1-1210	12/15/2010	ND		7.1	95	NA				59		4.7	19	NA				62.55	NA
GW-2 (FD)	GW-20-1210	12/15/2010	ND		7.7	100	NA				49		5.1	20	NA				52.85	NA
GW-2	GW-2-1210	12/15/2010	ND		7.7	100	NA				45		5.1	20	NA				48.85	NA
GW-3	GW-3-1210	12/15/2010	ND		7.7	100	NA				32		5.1	20	NA				35.85	NA
GW-4	GW-4-1210	12/15/2010	ND		7.4	98	NA				66		4.9	20	NA				69.7	NA
GW-1	GW-1-0311	3/21/2011	ND		7.1	95	NA				28		4.7	19	NA				31.55	NA
GW-2	GW-2-0311	3/21/2011	ND		7.1	95	NA				36		4.8	19	NA				39.55	NA
GW-3	GW-3-0311	3/21/2011	ND		7.1	95	NA				30		4.7	19	NA				33.55	NA
GW-3 (FD)	GW-30-0311	3/21/2011	ND		7.1	95	NA				27		4.7	19	NA				30.55	NA
EW-1	EW-1-0311	3/22/2011	ND		7.1	95	NA				32		4.7	19	NA				35.55	NA
GW-4	GW-4-0311	3/23/2011	ND		7.1	95	NA				69		4.7	19	NA				72.55	NA
EW-2A	EW-2A-0611	6/21/2011	ND		47	95	NA				ND		9.5	19	NA				28.25 (ND)	NA
GW-1	GW-1-0611	6/21/2011	ND		48	95	NA				ND		9.5	19	NA				28.75 (ND)	NA
GW-2	GW-2-0611	6/21/2011	ND		47	94	NA				53		9.4	19	NA				76.5	NA



Table 5-3 Total Petroleum Hydrocarbons (NWTPH-Dx) in Groundwater (µg/L) Analytical Results

Chemical Name			Oil Range				Oil Range with Silica Gel Cleanup				Diesel Range				Diesel Range with Silica Gel Cleanup				TPH (Calc)	TPH Silica Gel (Calc)
Location ID	Sample ID	Sample Date	Result	Q	MDL	MRL	Result	Q	MDL	MRL	Result	Q	MDL	MRL	Result	Q	MDL	MRL		
Backfill and Downgradient of the Hydraulic Control and Containment System																				
1B-W-23	1B-W-23-1210	12/15/2010	ND		7.5	100	NA				ND		5	20	NA				6.25 (ND)	NA
1B-W-23	1B-W-23-0311	3/23/2011	ND		7.4	99	NA				42		5	20	NA				45.7	NA
1B-W-23	1B-W-23	6/22/2011	ND		47	95	NA				ND		9.5	19	NA				28.25 (ND)	NA
1B-W-23	1B-W-23-0911	9/21/2011	210		47	94	NA				75		9.4	19	NA				285	NA
1C-W-7*	1C-W-7-1010	10/26/2010	ND		7.1	94	NA				99		4.7	19	NA				102.55	NA
1C-W-7*	1C-W-7-1110	11/30/2010	ND		7.1	94	NA				98		4.7	19	NA				101.55	NA
1C-W-7*	1C-W-7-1210	12/14/2010	130		7.4	99	NA				660		5	20	NA				790	NA
1C-W-7*	1C-W-7-0111	1/26/2011	ND		7.1	95	NA				82		4.7	19	NA				85.55	NA
1C-W-7* (FD)	1C-W-70-0111	1/26/2011	ND		7.1	95	NA				67		4.7	19	NA				70.55	NA
1C-W-7*	1C-W-7-0211	2/21/2011	ND		7.4	98	NA				89		4.9	20	NA				92.7	NA
1C-W-7*	1C-W-7-0311	3/22/2011	ND		7.3	97	NA				51		4.9	19	NA				54.65	NA
2A-W-40 (FD)	2A-W-400-0311	3/23/2011	ND		7.3	97	NA				ND		4.9	19	NA				6.1 (ND)	NA
1C-W-7*	1C-W-7-0411	4/27/2011	ND		7.3	97	NA				60		4.9	19	NA				63.65	NA
1C-W-7* (FD)	1C-W-70-0411	4/27/2011	ND		7.1	95	NA				70		4.8	19	NA				73.55	NA
1C-W-7*	1C-W-7-0511	5/19/2011	ND		47	95	NA				86		9.5	19	NA				109.5	NA
1C-W-7* (FD)	1C-W-70-0511	5/19/2011	ND		47	95	NA				72		9.5	19	NA				95.5	NA
1C-W-7*	1C-W-7-0611	6/22/2011	ND		47	94	NA				66		9.4	19	NA				89.5	NA
1C-W-7*	1C-W-7-0711	7/28/2011	ND		190	380	NA				61		38	76	NA				156	NA
1C-W-7*	1C-W-7-0811	8/30/2011	ND		47	95	NA				30		9.5	19	NA				53.5	NA
1C-W-7*	1C-W-7-0911	9/20/2011	ND		47	95	NA				39		9.5	19	NA				62.5	NA
2A-W-40	2A-W-40-1210	12/14/2010	ND		7.8	100	NA				50		5.2	21	NA				53.9	NA
2A-W-40	2A-W-40-0311	3/23/2011	ND		7.1	95	NA				ND		4.7	19	NA				5.9 (ND)	NA
2A-W-40	2A-W-40-0611	6/22/2011	ND		47	95	NA				ND		9.5	19	NA				28.25 (ND)	NA
2A-W-40 (FD)	2A-W-400-0611	6/22/2011	ND		47	95	NA				ND		9.5	19	NA				28.25 (ND)	NA
2A-W-40	2A-W-40-0911	9/20/2011	ND		50	99	NA				ND		9.9	20	NA				29.95 (ND)	NA
2A-W-40 (FD)	2A-W-400-0911	9/20/2011	ND		49	98	NA				ND		9.8	20	NA				29.4 (ND)	NA
2A-W-41	2A-W-41-1210	12/15/2010	ND		7.7	100	NA				130		5.1	20	NA				133.85	NA
2A-W-41	2A-W-41-0311	3/23/2011	ND		7.3	97	NA				30		4.9	19	NA				33.65	NA
2A-W-41	2A-W-41-0611	6/21/2011	ND		48	95	NA				26		9.5	19	NA				50	NA
2A-W-41	2A-W-41-0911	9/20/2011	ND		51	100	NA				23		10	20	NA				48.5	NA
2A-W-42	2A-W-42-1210	12/15/2010	180		7.1	95	NA				200		4.7	19	NA				380	NA
2A-W-42	2A-W-42-0311	3/22/2011	100		7.2	96	NA				140		4.8	19	NA				240	NA
2A-W-42	2A-W-42-0611	6/21/2011	ND		47	94	NA				65		9.4	19	NA				88.5	NA
2A-W-42	2A-W-42-0911	9/20/2011	ND		50	100	NA				84		10	20	NA				109	NA
5-W-43	5-W-43-1210	12/14/2010	ND		7.1	95	NA				30		4.7	19	NA				33.55	NA
5-W-43	5-W-43-0311	3/21/2011	ND		7.1	95	NA				20		4.7	19	NA				23.55	NA
5-W-43	5-W-43-0611	6/21/2011	ND		47	95	NA				ND		9.5	19	NA				28.25 (ND)	NA
5-W-43	5-W-43-0911	9/19/2011	ND		47	95	NA				ND		9.5	19	NA				28.25 (ND)	NA
Maximum			210				NA				660				NA				790	
Minimum			ND				NA				ND				NA				ND	
Average																			96**	
Hydraulic Control and Containment System Gate Vault Sentry Wells																				
S1-AD	S1-AD-030111	3/1/2011	ND		7.1	95	NA				ND		4.8	19	NA				5.95 (ND)	NA
S1-AU	S1-AU-030111	3/1/2011	ND		7.1	95	NA				ND		4.7	19	NA				5.9 (ND)	NA
S1-BD	S1-BD-030111	3/1/2011	ND		7.1	94	NA				ND		4.7	19	NA				5.9 (ND)	NA
S1-BU	S1-BU-030111	3/1/2011	ND		7.1	95	NA				ND		4.7	19	NA				5.9 (ND)	NA
S1-BU (FD)	S10-BU-030111	3/1/2011	ND		7.1	94	NA				ND		4.7	19	NA				5.9 (ND)	NA
S2-AD	S2-AD-030111	3/1/2011	ND		7.1	94	NA				ND		4.7	19	NA				5.9 (ND)	NA
S2-AU	S2-AU-030111	3/1/2011	ND		7.1	94	NA				ND		4.7	19	NA				5.9 (ND)	NA
S2-BD	S2-BD-030111	3/1/2011	ND		7.1	95	NA				ND		4.7	19	NA				5.9 (ND)	NA
S2-BU	S2-BU-030111	3/1/2011	ND		7.1	95	NA				39		4.7	19	NA				42.55	NA
S3-AD	S3-AD-030111	3/1/2011	ND		7.1	95	NA				ND		4.8	19	NA				5.95 (ND)	NA
S3-AU	S3-AU-030111	3/1/2011	ND		7.1	94	NA				27	J	4.7	19	NA				30.55	NA
S3-AU (FD)	S30-AU-030111	3/1/2011	ND		7.1	95	NA				ND	J	4.7	19	NA				5.9 (ND)	NA
S3-BD	S3-BD-030111	3/1/2011	ND		7.1	94	NA				ND		4.7	19	NA				5.9 (ND)	NA
S3-BU	S3-BU-030111	3/1/2011	ND		7.1	95	NA				37		4.7	19	NA				40.55	NA
S3-CD	S3-CD-030111	3/1/2011	ND		7.1	95	NA				ND		4.7	19	NA				5.9 (ND)	NA
S3-CU	S3-CU-030111	3/1/2011	ND		7.1	95	NA				ND		4.7	19	NA				5.9 (ND)	NA
S4-AD	S4-AD-030111	3/1/2011	ND		7.1	95	NA				62	J	4.7	19	NA				65.55	NA
S4-AU	S4-AU-030111	3/1/2011	ND		7.1	95	NA				29		4.7	19	NA				32.55	NA

Table 5-3 Total Petroleum Hydrocarbons (NWTPH-Dx) in Groundwater (µg/L) Analytical Results

Chemical Name			Oil Range				Oil Range with Silica Gel Cleanup				Diesel Range				Diesel Range with Silica Gel Cleanup				TPH (Calc)	TPH Silica Gel (Calc)		
Location ID	Sample ID	Sample Date	Result	Q	MDL	MRL	Result	Q	MDL	MRL	Result	Q	MDL	MRL	Result	Q	MDL	MRL				
S1-AD	S1-AD-0911	9/20/2011	ND		47	94	NA				ND		9.4	19	NA				28.2 (ND)	NA		
S1-AU	S1-AU-0911	9/20/2011	ND		47	94	NA				ND		9.4	19	NA				28.2 (ND)	NA		
S1-BD	S1-BD-0911	9/20/2011	320		47	94	NA				47		9.4	19	NA				367	NA		
S1-BU	S1-BU-0911	9/20/2011	ND		47	94	NA				ND		9.4	19	NA				28.2 (ND)	NA		
S2-AD	S2-AD-0911	9/20/2011	ND		47	95	NA				ND		9.5	19	NA				28.25 (ND)	NA		
S2-AU	S2-AU-0911	9/20/2011	ND		47	94	NA				ND		9.4	19	NA				28.2 (ND)	NA		
S2-BD	S2-BD-0911	9/20/2011	130		47	94	NA				47		9.4	19	NA				177	NA		
S2-BU	S2-BU-0911	9/20/2011	ND		47	94	NA				ND		9.4	19	NA				28.2 (ND)	NA		
S3-AD	S3-AD-0911	9/20/2011	ND		47	95	NA				ND		9.5	19	NA				28.25 (ND)	NA		
S3-AU	S3-AU-0911	9/20/2011	ND		47	94	NA				ND		9.4	19	NA				28.2 (ND)	NA		
S3-AU (FD)	S30-AU-0911	9/20/2011	ND		47	95	NA				ND		9.5	19	NA				28.25 (ND)	NA		
S3-BD	S3-BD-0911	9/20/2011	ND		48	96	NA				ND		9.6	19	NA				28.8 (ND)	NA		
S3-BU	S3-BU-0911	9/20/2011	ND		47	94	NA				110		9.4	19	NA				133.5	NA		
S3-CD	S3-CD-0911	9/20/2011	ND		47	94	NA				ND		9.4	19	NA				28.2 (ND)	NA		
S3-CU	S3-CU-0911	9/20/2011	ND		48	95	NA				ND		9.5	19	NA				28.75 (ND)	NA		
S4-AD	S4-AD-0911	9/20/2011	ND		47	94	NA				25		9.4	19	NA				48.5	NA		
S4-AU	S4-AU-0911	9/20/2011	ND		47	94	NA				ND		9.4	19	NA				28.2 (ND)	NA		
S4-AU (FD)	S40-AU-0911	9/20/2011	ND		47	94	NA				ND		9.4	19	NA				28.2 (ND)	NA		
S4-BD	S4-BD-0911	9/20/2011	ND		49	98	NA				ND		9.8	20	NA				29.4 (ND)	NA		
S4-BU	S4-BU-0911	9/20/2011	170		51	100	NA				61		10	20	NA				231	NA		
S4-CD	S4-CD-0911	9/20/2011	ND		48	96	NA				25		9.6	19	NA				49	NA		
S4-CU	S4-CU-0911	9/20/2011	ND		48	96	NA				42		9.6	19	NA				66	NA		
Maximum			410				NA				660				NA				367			
Minimum			ND				NA				ND				NA				ND			
Average																			116**			
Levee Zone																						
5-W-14	5-W-14-1210	12/16/2010	ND		7.5	100	ND		16	100	ND		5	20	ND		9.6	21	6.25 (ND)	12.8 (ND)		
5-W-14	5-W-14-0311	3/22/2011	ND		7.3	97	ND		15	97	ND		4.9	19	ND		9	19	6.1 (ND)	12 (ND)		
5-W-14	5-W-14-0611	6/22/2011	ND		48	95	ND		47	95	ND		9.5	19	ND		9.5	19	28.75 (ND)	28.25 (ND)		
5-W-14	5-W-14-0911	9/21/2011	ND		47	95	ND		47	95	ND		9.5	19	ND		9.5	19	28.25 (ND)	28.25 (ND)		
5-W-15	5-W-15-1210	12/16/2010	340		7.5	100	ND		15	98	490		5	20	65		9.1	20	830	72.5		
5-W-15 (FD)	5-W-150-1210	12/16/2010	350		7.7	100	ND		15	100	470		5.1	20	59		9.2	20	820	66.5		
5-W-15	5-W-15-0311	3/22/2011	220		7.3	97	ND		15	97	350		4.9	19	33		9	19	570	40.5		
5-W-15	5-W-15-0611	6/22/2011	190		47	94	ND		47	95	280		9.4	19	53		9.5	19	470	76.5		
5-W-15 (FD)	5-W-150-0611	6/22/2011	190		47	95	ND		47	95	270		9.5	19	61		9.5	19	460	84.5		
5-W-15	5-W-15-0911	9/21/2011	140		47	95	ND		47	95	170		9.5	19	67		9.5	19	310	90.5		
5-W-16	5-W-16-1210	12/16/2010	ND		7.1	95	ND		14	95	100		4.7	19	ND		8.8	19	103.55	11.4 (ND)		
5-W-16	5-W-16-0311	3/22/2011	ND		7.3	97	ND		15	97	28		4.9	19	ND		9	19	31.65	12 (ND)		
5-W-17 (FD)	5-W-170-0311	3/22/2011	ND		7.3	97	ND		15	97	ND		4.9	19	ND		9	19	6.1 (ND)	12 (ND)		
5-W-16	5-W-16-0611	6/22/2011	ND		47	95	ND		47	95	ND		9.5	19	ND		9.5	19	28.25 (ND)	28.25 (ND)		
5-W-16	5-W-16-0911	9/21/2011	ND		47	95	ND		47	95	ND		9.5	19	ND		9.5	19	28.25 (ND)	28.25 (ND)		
5-W-17	5-W-17-1210	12/16/2010	ND		7.1	95	ND		14	95	ND		4.7	19	ND		8.8	19	5.9 (ND)	11.4 (ND)		
5-W-17	5-W-17-0311	3/22/2011	ND		7.3	97	ND		15	97	ND		4.9	19	ND		9	19	6.1 (ND)	12 (ND)		
5-W-17	5-W-17-0611	6/22/2011	ND		47	94	ND		47	95	ND		9.4	19	ND		9.5	19	28.2 (ND)	28.25 (ND)		
5-W-17	5-W-17-0911	9/21/2011	ND		47	95	ND		47	95	ND		9.5	19	ND		9.5	19	28.25 (ND)	28.25 (ND)		
5-W-17 (FD)	5-W-170-0911	9/21/2011	ND		47	95	ND		47	95	ND		9.5	19	ND		9.5	19	28.25 (ND)	28.25 (ND)		
5-W-18	5-W-18-1210	12/15/2010	110		7.1	95	ND		14	95	160		4.7	19	33		8.8	19	270	40		
5-W-18	5-W-18-0311	3/22/2011	110		7.1	94	ND		14	94	160		4.7	19	34		8.7	19	270	41		
5-W-18	5-W-18-0611	6/22/2011	140		47	95	ND		47	95	200		9.5	19	31		9.5	19	340	54.5		
5-W-18	5-W-18-0911	9/21/2011	97		47	95	ND		47	95	120		9.5	19	42		9.5	19	217	65.5		
5-W-19	5-W-19-1210	12/16/2010	ND		7.8	100	ND		15	99	ND		5.2	21	ND		9.2	20	6.5 (ND)	12.1 (ND)		
5-W-19	5-W-19-0311	3/22/2011	ND		7.1	94	ND		14	94	ND		4.7	19	ND		8.7	19	5.9 (ND)	11.35 (ND)		
5-W-19	5-W-19-0611	6/22/2011	ND		47	95	ND		47	95	ND		9.5	19	ND		9.5	19	28.25 (ND)	28.25 (ND)		
5-W-19	5-W-19-0911	9/21/2011	ND		47	95	ND		47	95	ND		9.5	19	ND		9.5	19	28.25 (ND)	28.25 (ND)		
5-W-20	5-W-20-1210	12/15/2010	180		7.1	95	ND		14	95	250		4.7	19	ND		8.8	19	430	11.4 (ND)		
5-W-20	5-W-20-0311	3/22/2011	ND		7.1	94	ND		14	94	130		4.7	19	ND		8.7	19	133.55	11.35 (ND)		
5-W-42	5-W-42-1210	12/15/2010	ND		7.1	95	ND		15	95	110		4.7	19	ND		8.8	19	113.55	11.9 (ND)		
5-W-42	5-W-42-0311	3/22/2011	ND		7.1	94	ND		14	94	36		4.7	19	ND		8.7	19	39.55	11.35 (ND)		
Maximum			350				NA				490				NA				830	90.5		
Minimum			ND				NA															

Table 5-3 Total Petroleum Hydrocarbons (NWTPH-Dx) in Groundwater (µg/L) Analytical Results

Chemical Name			Oil Range				Oil Range with Silica Gel Cleanup				Diesel Range				Diesel Range with Silica Gel Cleanup				TPH (Calc)	TPH Silica Gel (Calc)
Location ID	Sample ID	Sample Date	Result	Q	MDL	MRL	Result	Q	MDL	MRL	Result	Q	MDL	MRL	Result	Q	MDL	MRL		
Schoolyard Perimeter Zone																				
5-W-50	5-W-50-0311	3/22/2011	790		7.1	95	NA				1200		4.8	19	NA				1990	NA
5-W-51	5-W-51-0311	3/22/2011	8700		7.1	95	NA				10000		24	95	NA				18700	NA
5-W-54	5-W-54-0311	3/22/2011	ND		7.7	100	NA				23		5.1	20	NA				26.85	NA
5-W-54 (FD)	5-W-540-0311	3/22/2011	ND		7.5	100	NA				24		5	20	NA				27.75	NA
5-W-55	5-W-55-0311	3/23/2011	130		7.2	96	NA				140		4.8	19	NA				270	NA
5-W-56	5-W-56-0311	3/23/2011	1000		7.2	96	NA				1500		4.8	19	NA				2500	NA
5-W-50	5-W-50-0911	9/21/2011	500		47	95	NA				1000		9.5	19	NA				1500	NA
5-W-51	5-W-51-0911	9/21/2011	2100		47	94	NA				2100		9.4	19	NA				4200	NA
5-W-54	5-W-54-0911	9/21/2011	ND		47	94	NA				20		9.4	19	NA				43.5	NA
5-W-55	5-W-55-0911	9/21/2011	240		47	94	NA				260		9.4	19	NA				500	NA
5-W-56	5-W-56-0911	9/21/2011	570	J	47	94	NA				950	J	9.4	19	NA				1520	NA
Maximum			8700				NA				10000				NA				18700	
Minimum			ND				NA				20				NA				43.5	
Average																			2843**	

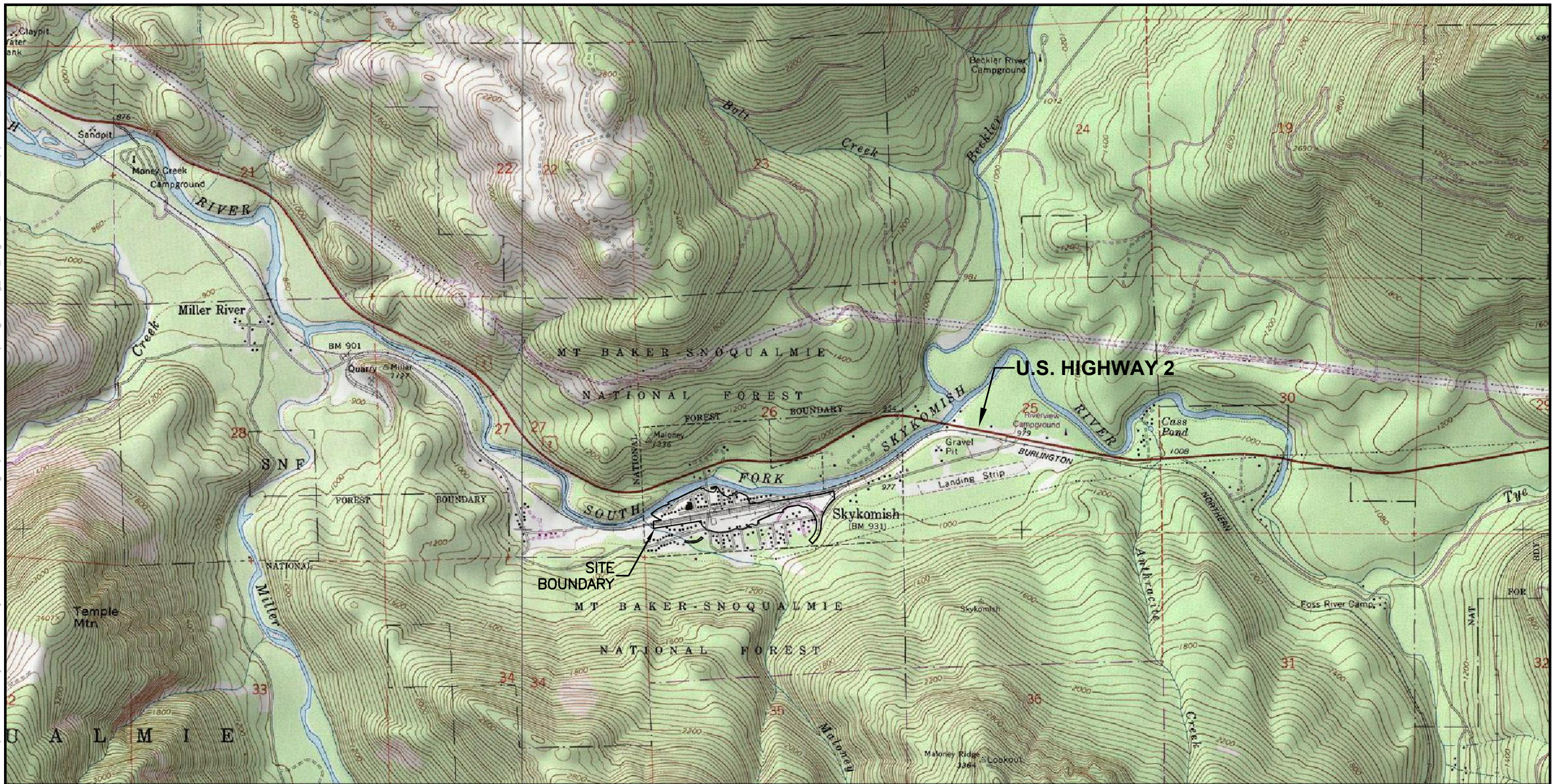
**Notes:**  
\* Location is being monitored for multiple assessments.  
\*\*Value based on calculated concentrations, excluding non-detects.  
All samples analyzed by NWTPH-Dx with or without silica gel cleanup.  
Units = µg/L  
**Bold** Exceeds cleanup level (CUL) of 208 ug/L or remediation level (RL) of 477 ug/L  
**Light Green** Trace LNAPL  
MDL Method Detection Limit; Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B.  
MRL Method Reporting Limit; Reporting Level at, or above, the lowest level standard of the Calibration Table.  
Results between the MDL and MRL are reported as Estimated Results.  
Q Qualifier  
µg/L micrograms per liter  
FD Field Duplicate  
HCC Hydraulic Control and Containment  
J Estimated concentration  
NA Not Analyzed  
ND Not Detected  
(ND) Both the Oil Range and Diesel Range Hydrocarbons were non-detect, but the TPH (calc) value is shown.  
TPH Total Petroleum Hydrocarbons  
TPH (calc) Sum of the Oil Range and Diesel Range Hydrocarbons by Method NWTPH-Dx. 1/2 the MDL was used for all NDs.  
TPH-SG (calc) Sum of the Oil Range and Diesel Range Hydrocarbons by Method NWTPH-Dx with Silica Gel Cleanup. 1/2 the MDL was used for all NDs.

Table 5-4 Total Petroleum Hydrocarbons (NWTPH-Dx) in Groundwater (µg/L) Semi-Annual Site-Wide Analytical Results\*

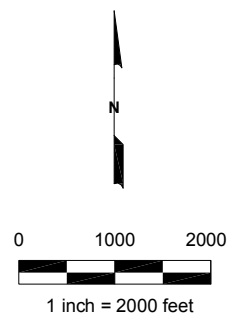
Chemical Name			Oil Range				Oil Range with Silica Gel Cleanup				Diesel Range				Diesel Range with Silica Gel Cleanup				TPH (Calc)	TPH Silica Gel (Calc)
Location ID	Sample ID	Sample Date	Result	Q	MDL	MRL	Result	Q	MDL	MRL	Result	Q	MDL	MRL	Result	Q	MDL	MRL		
March 2011 Semi-Annual Event Results																				
2B-W-4	2B-W-4-0311	3/21/2011	ND		7.1	95	NA				ND		4.7	19	NA				5.9 (ND)	NA
5-W-43	5-W-43-0311	3/21/2011	ND		7.1	95	NA				20		4.7	19	NA				23.55	NA
GW-1	GW-1-0311	3/21/2011	ND		7.1	95	NA				28		4.7	19	NA				31.55	NA
GW-2	GW-2-0311	3/21/2011	ND		7.1	95	NA				36		4.8	19	NA				39.55	NA
GW-3	GW-3-0311	3/21/2011	ND		7.1	95	NA				30		4.7	19	NA				33.55	NA
GW-3 (FD)	GW-30-0311	3/21/2011	ND		7.1	95	NA				27		4.7	19	NA				30.55	NA
MW-38R	MW-38R-0311	3/21/2011	ND		7.1	95	NA				47		4.8	19	NA				50.55	NA
1B-W-2	1B-W-2-0311	3/22/2011	ND		7.9	110	NA				49		5.3	21	NA				52.95	NA
1B-W-3	1B-W-3-0311	3/22/2011	ND		7.3	97	NA				ND		4.9	19	NA				6.1 (ND)	NA
1C-W-1	1C-W-1-0311	3/22/2011	ND		7.3	97	NA				55		4.9	19	NA				58.65	NA
1C-W-3	1C-W-3-0311	3/22/2011	ND		7.1	94	NA				ND		4.7	19	NA				5.9 (ND)	NA
1C-W-4	1C-W-4-0311	3/22/2011	210		7.4	99	NA				250		5	20	NA				460	NA
1C-W-7	1C-W-7-0311	3/22/2011	ND		7.3	97	NA				51		4.9	19	NA				54.65	NA
1C-W-8	1C-W-8-0311	3/22/2011	120		7.1	95	NA				250		4.7	19	NA				370	NA
2A-W-42	2A-W-42-0311	3/22/2011	100		7.2	96	NA				140		4.8	19	NA				240	NA
5-W-14	5-W-14-0311	3/22/2011	ND		7.3	97	ND		15	97	ND		4.9	19	ND		9	19	6.1 (ND)	12 (ND)
5-W-15	5-W-15-0311	3/22/2011	220		7.3	97	ND		15	97	350		4.9	19	33		9	19	570	40.5
5-W-16	5-W-16-0311	3/22/2011	ND		7.3	97	ND		15	97	28		4.9	19	ND		9	19	31.65	12 (ND)
5-W-17	5-W-17-0311	3/22/2011	ND		7.3	97	ND		15	97	ND		4.9	19	ND		9	19	6.1 (ND)	12 (ND)
5-W-17 (FD)	5-W-170-0311	3/22/2011	ND		7.3	97	ND		15	97	ND		4.9	19	ND		9	19	6.1 (ND)	12 (ND)
5-W-18	5-W-18-0311	3/22/2011	110		7.1	94	ND		14	94	160		4.7	19	34		8.7	19	270	41
5-W-19	5-W-19-0311	3/22/2011	ND		7.1	94	ND		14	94	ND		4.7	19	ND		8.7	19	5.9 (ND)	11.35 (ND)
5-W-20	5-W-20-0311	3/22/2011	ND		7.1	94	ND		14	94	130		4.7	19	ND		8.7	19	133.55	11.35 (ND)
5-W-42	5-W-42-0311	3/22/2011	ND		7.1	94	ND		14	94	36		4.7	19	ND		8.7	19	39.55	11.35 (ND)
5-W-50	5-W-50-0311	3/22/2011	790		7.1	95	NA				1200		4.8	19	NA				1990	NA
5-W-51	5-W-51-0311	3/22/2011	8700		7.1	95	NA				10000		24	95	NA				18700	NA
5-W-54	5-W-54-0311	3/22/2011	ND		7.7	100	NA				23		5.1	20	NA				26.85	NA
5-W-54 (FD)	5-W-540-0311	3/22/2011	ND		7.5	100	NA				24		5	20	NA				27.75	NA
EW-1	EW-1-0311	3/22/2011	ND		7.1	95	NA				32		4.7	19	NA				35.55	NA
MW-16	MW-16-0311	3/22/2011	ND		7.1	95	NA				ND		4.7	19	NA				5.9 (ND)	NA
MW-16 (FD)	MW-160-0311	3/22/2011	ND		7.1	95	NA				ND		4.7	19	NA				5.9 (ND)	NA
1A-W-4	1A-W-4-0311	3/23/2011	ND		7.5	100	NA				ND		5	20	NA				6.25 (ND)	NA
1B-W-23	1B-W-23-0311	3/23/2011	ND		7.4	99	NA				42		5	20	NA				45.7	NA
2A-W-10	2A-W-10-0311	3/23/2011	340		7.1	95	NA				160		4.7	19	NA				500	NA
2A-W-40	2A-W-40-0311	3/23/2011	ND		7.1	95	NA				ND		4.7	19	NA				5.9 (ND)	NA
2A-W-40 (FD)	2A-W-400-0311	3/23/2011	ND		7.3	97	NA				ND		4.9	19	NA				6.1 (ND)	NA
2A-W-41	2A-W-41-0311	3/23/2011	ND		7.3	97	NA				30		4.9	19	NA				33.65	NA
2A-W-9	2A-W-9-0311	3/23/2011	230		7.1	95	NA				400		4.7	19	NA				630	NA
5-W-55	5-W-55-0311	3/23/2011	130		7.2	96	NA				140		4.8	19	NA				270	NA
5-W-56	5-W-56-0311	3/23/2011	1000		7.2	96	NA				1500		4.8	19	NA				2500	NA
GW-4	GW-4-0311	3/23/2011	ND		7.1	95	NA				69		4.7	19	NA				72.55	NA
MW-3	MW-3-0311	3/23/2011	120		7.1	95	NA				72		4.7	19	NA				192	NA
MW-4	MW-4-0311	3/23/2011	240		7.1	95	NA				130		4.7	19	NA				370	NA
Maximum			8700				ND				10000				34				18700	41
Minimum			ND				ND				ND				ND				ND	ND
Average																			899**	41**
September 2011 Semi-Annual Event Results																				
2A-W-10	ZA-W-10-0911	9/19/2011	390		47	95	NA				190		9.5	19	NA				580	NA
2A-W-9	2A-W-9-0911	9/19/2011	440		47	95	NA				660		9.5	19	NA				1100	NA
2B-W-4	ZB-W-4-0911	9/19/2011	ND		47	95	NA				ND		9.5	19	NA				28.25 (ND)	NA
5-W-43	S-W-43-0911	9/19/2011	ND		47	95	NA				ND		9.5	19	NA				28.25 (ND)	NA
GW-1	GW-1-0911	9/19/2011	ND		47	95	NA				84		9.5	19	NA				107.5	NA
MW-3	MW-3-0911	9/19/2011	110		47	95	NA				67		9.5	19	NA				177	NA
MW-4	MW-4-0911	9/19/2011	ND		47	95	NA				25		9.5	19	NA				48.5	NA
MW-4 (FD)	MW-400-0911	9/19/2011	ND		47	95	NA				25		9.5	19	NA				48.5	NA
1B-W-2	1B-W-2-0911	9/20/2011	ND		47	95	NA				120		9.5	19	NA				143.5	NA
1B-W-3	1B-W-3-0911	9/20/2011	ND		47	95	NA				38		9.5	19	NA				61.5	NA
1C-W-1	1C-W-1-0911	9/20/2011	ND		47	95	NA				38		9.5	19	NA				61.5	NA
1C-W-3	1C-W-3-0911	9/20/2011	ND		47	95	NA				33		9.5	19	NA				56.5	NA
1C-W-4	1C-W-4-0911	9/20/2011	ND		47	95	NA				51		9.5	19	NA				74.5	NA
1C-W-7	1C-W-7-0911	9/20/2011	ND		47	95	NA				39		9.5	19	NA				62.5	NA
1C-W-8	1C-W-8-0911	9/																		



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SOURCE: TOPOI, National Geographic Holdings, Inc.



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60136319-0545

DATE: 10/28/09

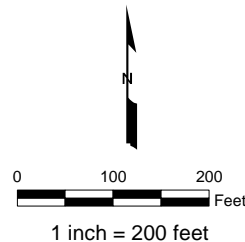
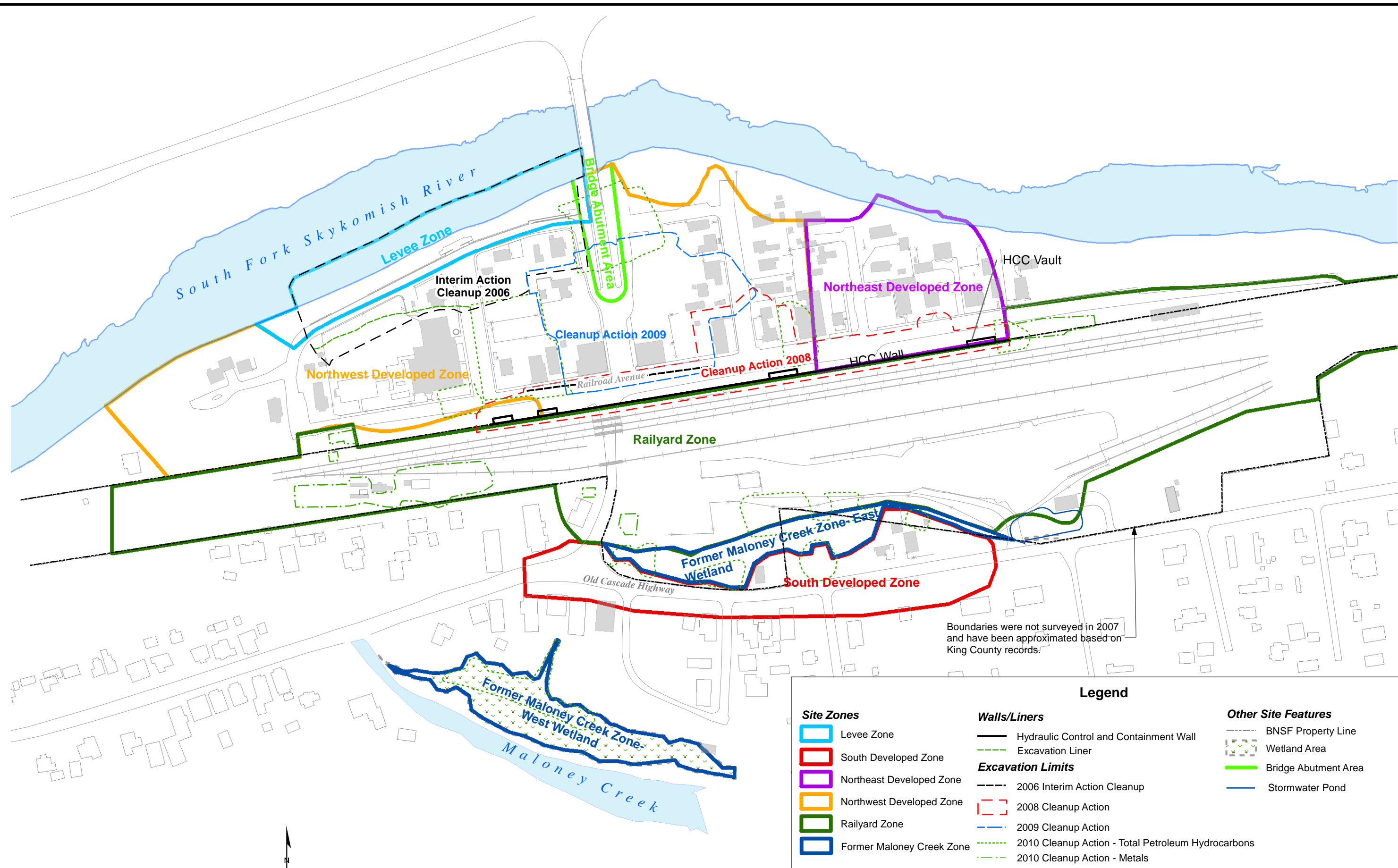
DRWN: H.H./BHAM

Regional Location Map

FIGURE 1-1



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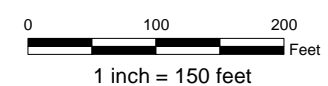
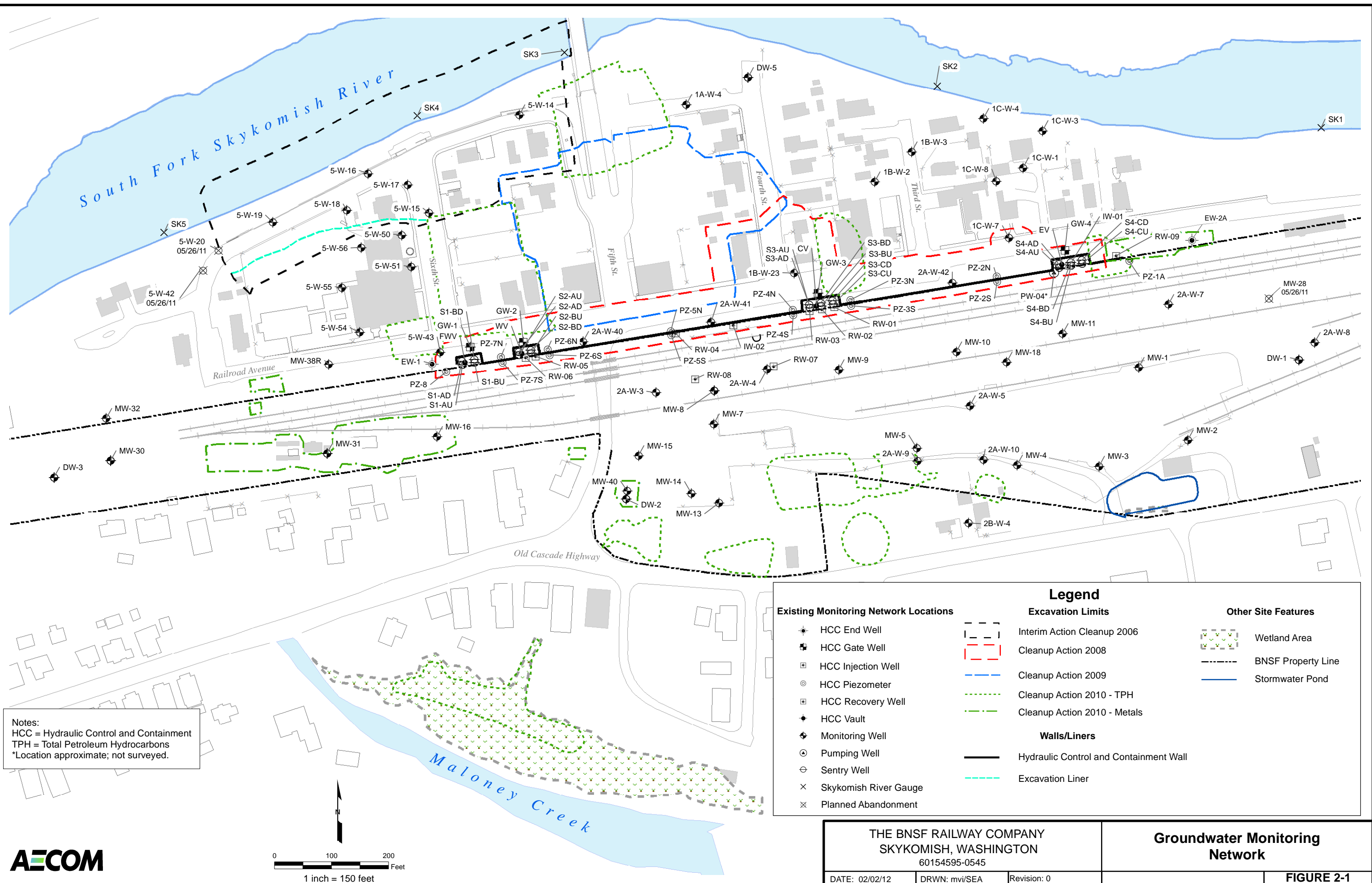
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60154595-0545

DATE: 11/16/10 | DRWN:mvi/Sea | Revision: 0

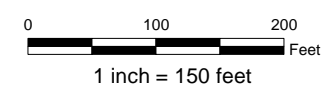
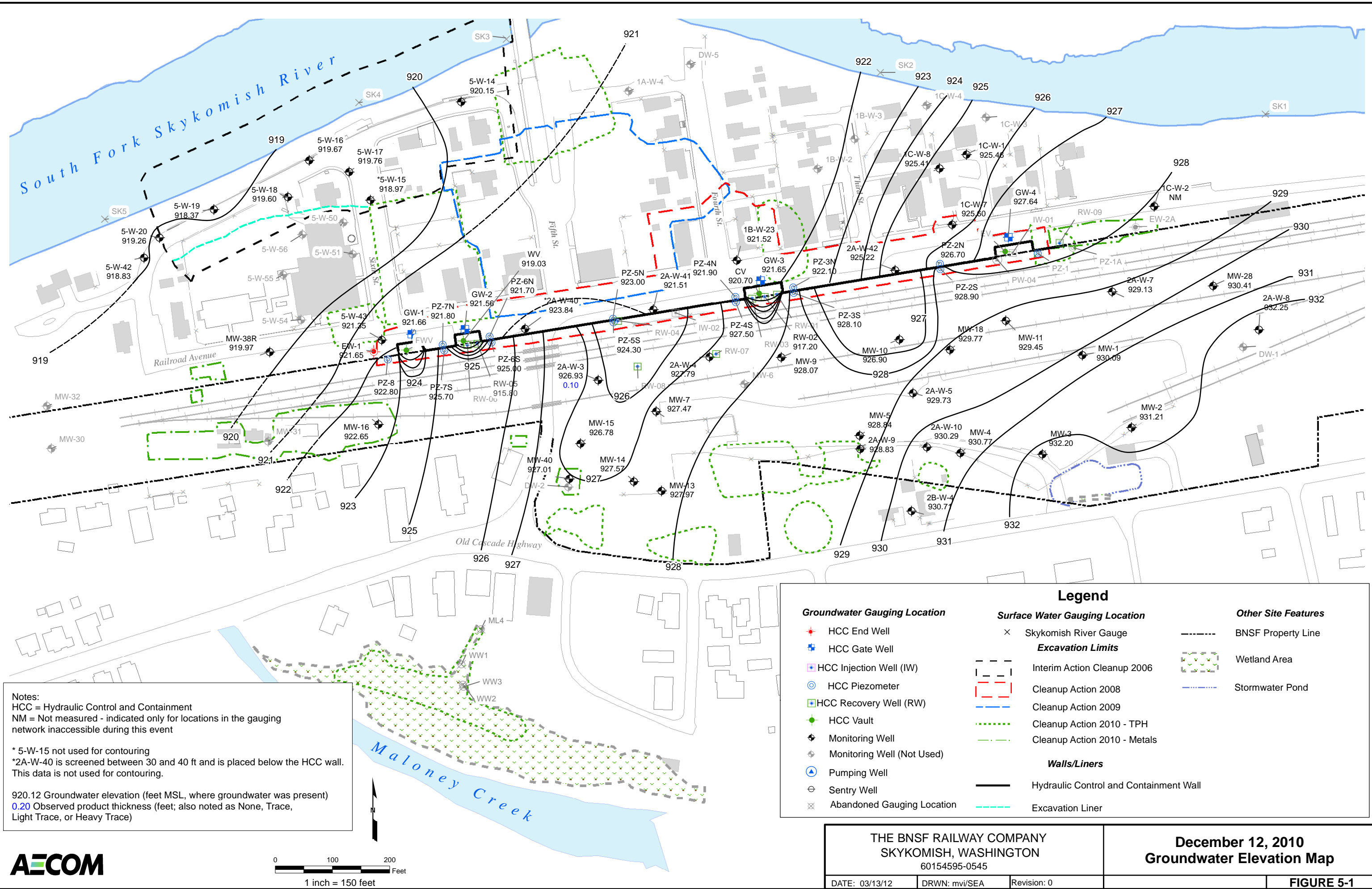
Site Layout and Site Zones

FIGURE 1-2

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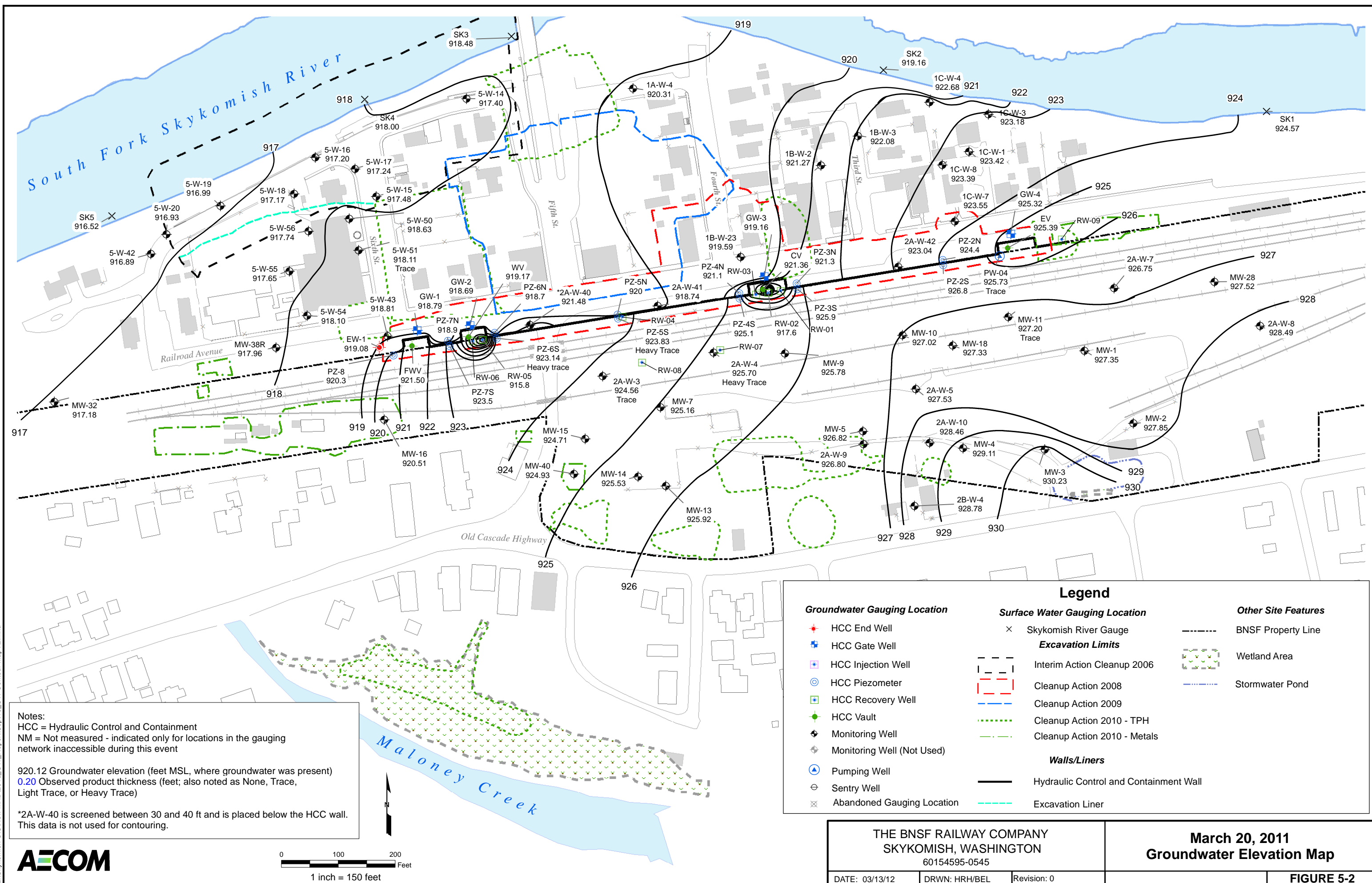


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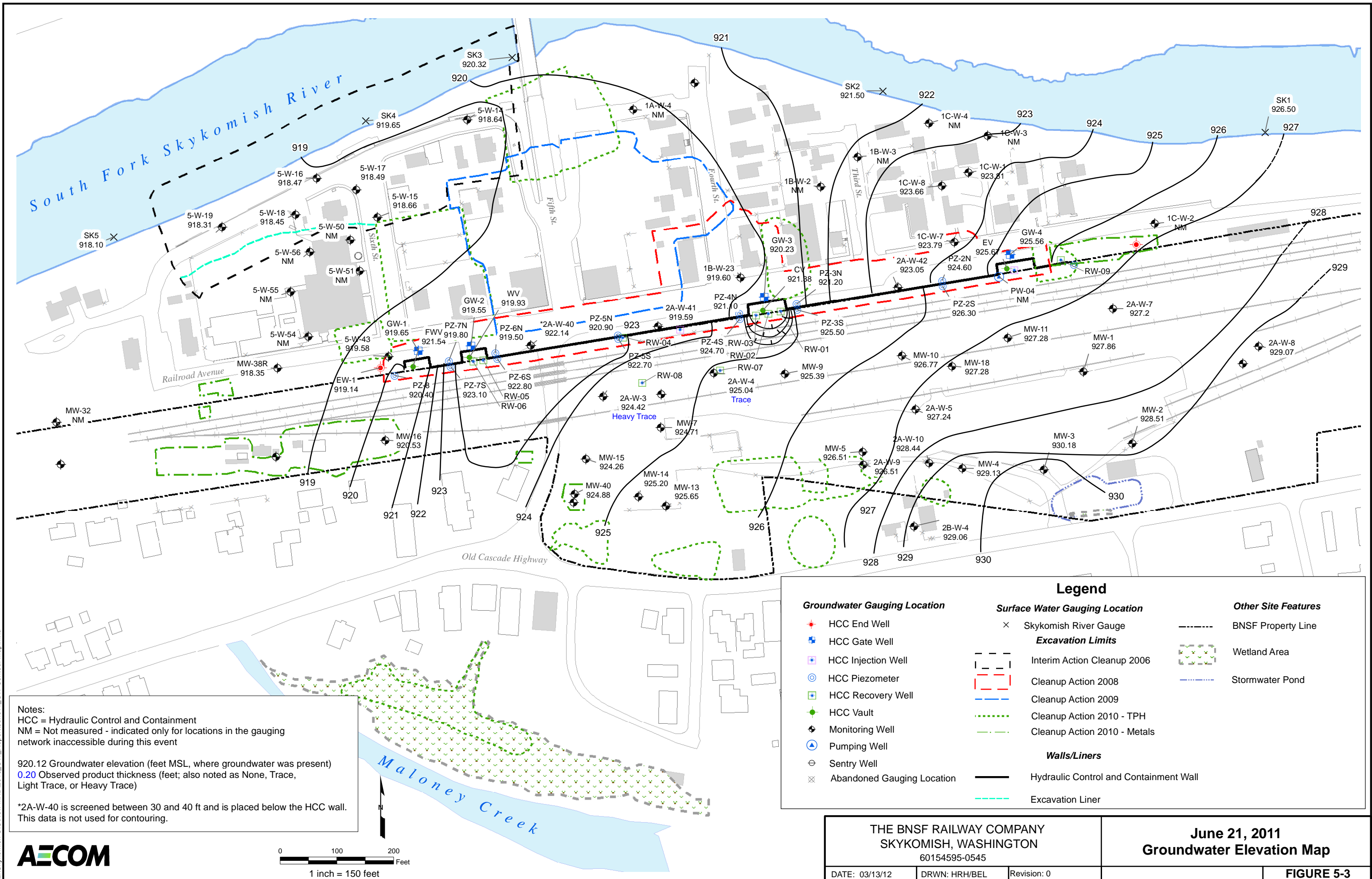




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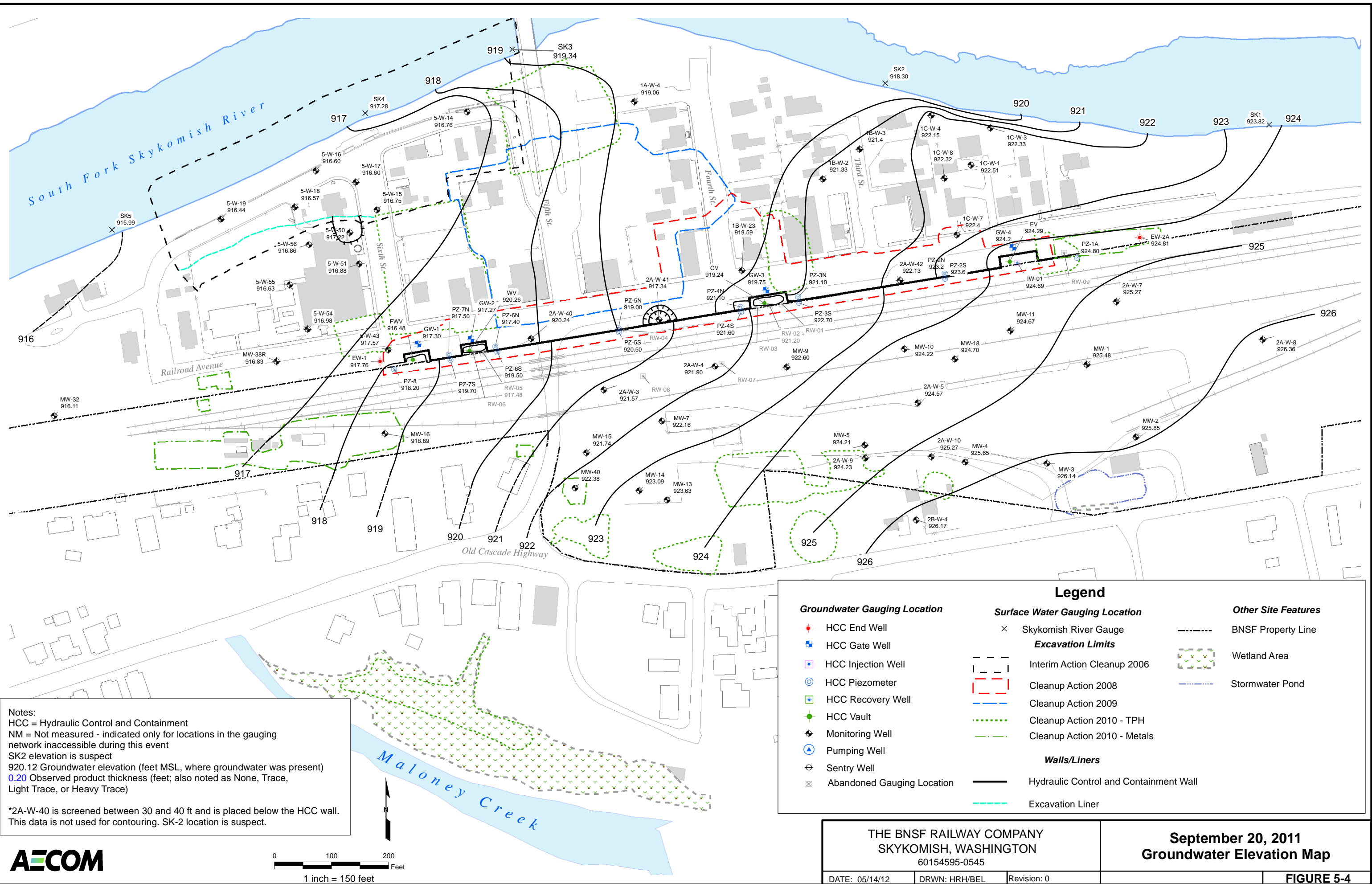
June 21, 2011  
Groundwater Elevation Map

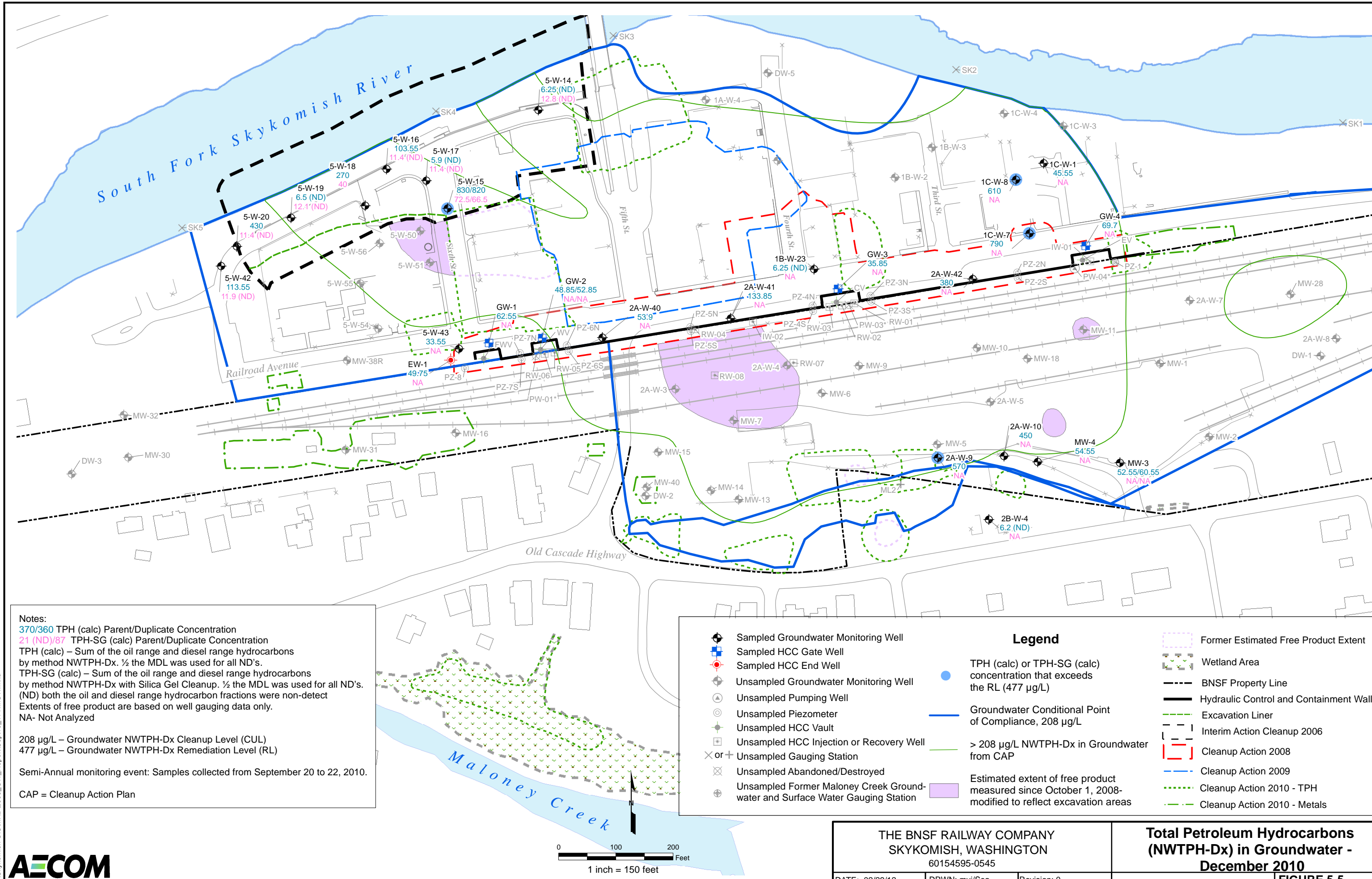
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FIGURE 5-3



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Notes:  
370/360 TPH (calc) Parent/Duplicate Concentration  
21 (ND)/87 TPH-SG (calc) Parent/Duplicate Concentration  
TPH (calc) – Sum of the oil range and diesel range hydrocarbons by method NWT TPH-Dx. ½ the MDL was used for all ND's.  
TPH-SG (calc) – Sum of the oil range and diesel range hydrocarbons by method NWT TPH-Dx with Silica Gel Cleanup. ½ the MDL was used for all ND's. (ND) both the oil and diesel range hydrocarbon fractions were non-detect  
Extents of free product are based on well gauging data only.  
NA- Not Analyzed

208 µg/L – Groundwater NWT TPH-Dx Cleanup Level (CUL)  
477 µg/L – Groundwater NWT TPH-Dx Remediation Level (RL)

Semi-Annual monitoring event: Samples collected from September 20 to 22, 2010.

CAP = Cleanup Action Plan

**Legend**

TPH (calc) or TPH-SG (calc) concentration that exceeds the RL (477 µg/L)

Groundwater Conditional Point of Compliance, 208 µg/L

> 208 µg/L NWT TPH-Dx in Groundwater from CAP

Estimated extent of free product measured since October 1, 2008- modified to reflect excavation areas

Sampled Groundwater Monitoring Well

Sampled HCC Gate Well

Sampled HCC End Well

Unsampled Groundwater Monitoring Well

Unsampled Pumping Well

Unsampled Piezometer

Unsampled HCC Vault

Unsampled HCC Injection or Recovery Well

Unsampled Gauging Station

Unsampled Abandoned/Destroyed

Unsampled Former Maloney Creek Groundwater and Surface Water Gauging Station

Former Estimated Free Product Extent

Wetland Area

BNSF Property Line

Hydraulic Control and Containment Wall

Excavation Liner

Interim Action Cleanup 2006

Cleanup Action 2008

Cleanup Action 2009

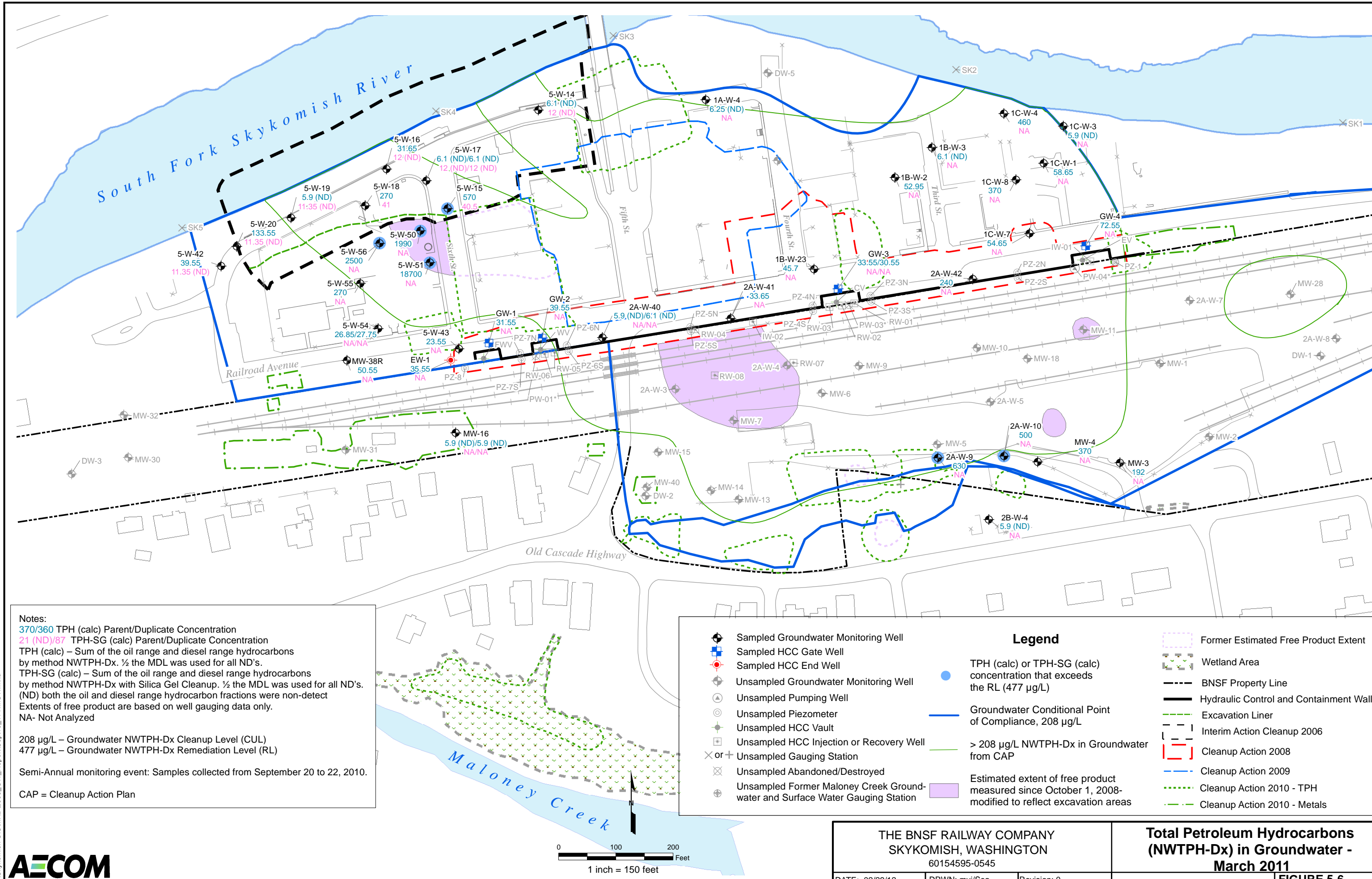
Cleanup Action 2010 - TPH

Cleanup Action 2010 - Metals



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Notes:  
370/360 TPH (calc) Parent/Duplicate Concentration  
21 (ND)/87 TPH-SG (calc) Parent/Duplicate Concentration  
TPH (calc) – Sum of the oil range and diesel range hydrocarbons by method NWTPH-Dx. ½ the MDL was used for all ND's.  
TPH-SG (calc) – Sum of the oil range and diesel range hydrocarbons by method NWTPH-Dx with Silica Gel Cleanup. ½ the MDL was used for all ND's. (ND) both the oil and diesel range hydrocarbon fractions were non-detect  
Extents of free product are based on well gauging data only.  
NA- Not Analyzed

208 µg/L – Groundwater NWTPH-Dx Cleanup Level (CUL)  
477 µg/L – Groundwater NWTPH-Dx Remediation Level (RL)

Semi-Annual monitoring event: Samples collected from September 20 to 22, 2010.

CAP = Cleanup Action Plan

**Legend**

TPH (calc) or TPH-SG (calc) concentration that exceeds the RL (477 µg/L)

Groundwater Conditional Point of Compliance, 208 µg/L

> 208 µg/L NWTPH-Dx in Groundwater from CAP

Estimated extent of free product measured since October 1, 2008- modified to reflect excavation areas

Sampled Groundwater Monitoring Well

Sampled HCC Gate Well

Sampled HCC End Well

Unsampled Groundwater Monitoring Well

Unsampled Pumping Well

Unsampled Piezometer

Unsampled HCC Vault

Unsampled HCC Injection or Recovery Well

Unsampled Gauging Station

Unsampled Abandoned/Destroyed

Unsampled Former Maloney Creek Groundwater and Surface Water Gauging Station

Former Estimated Free Product Extent

Wetland Area

BNSF Property Line

Hydraulic Control and Containment Wall

Excavation Liner

Interim Action Cleanup 2006

Cleanup Action 2008

Cleanup Action 2009

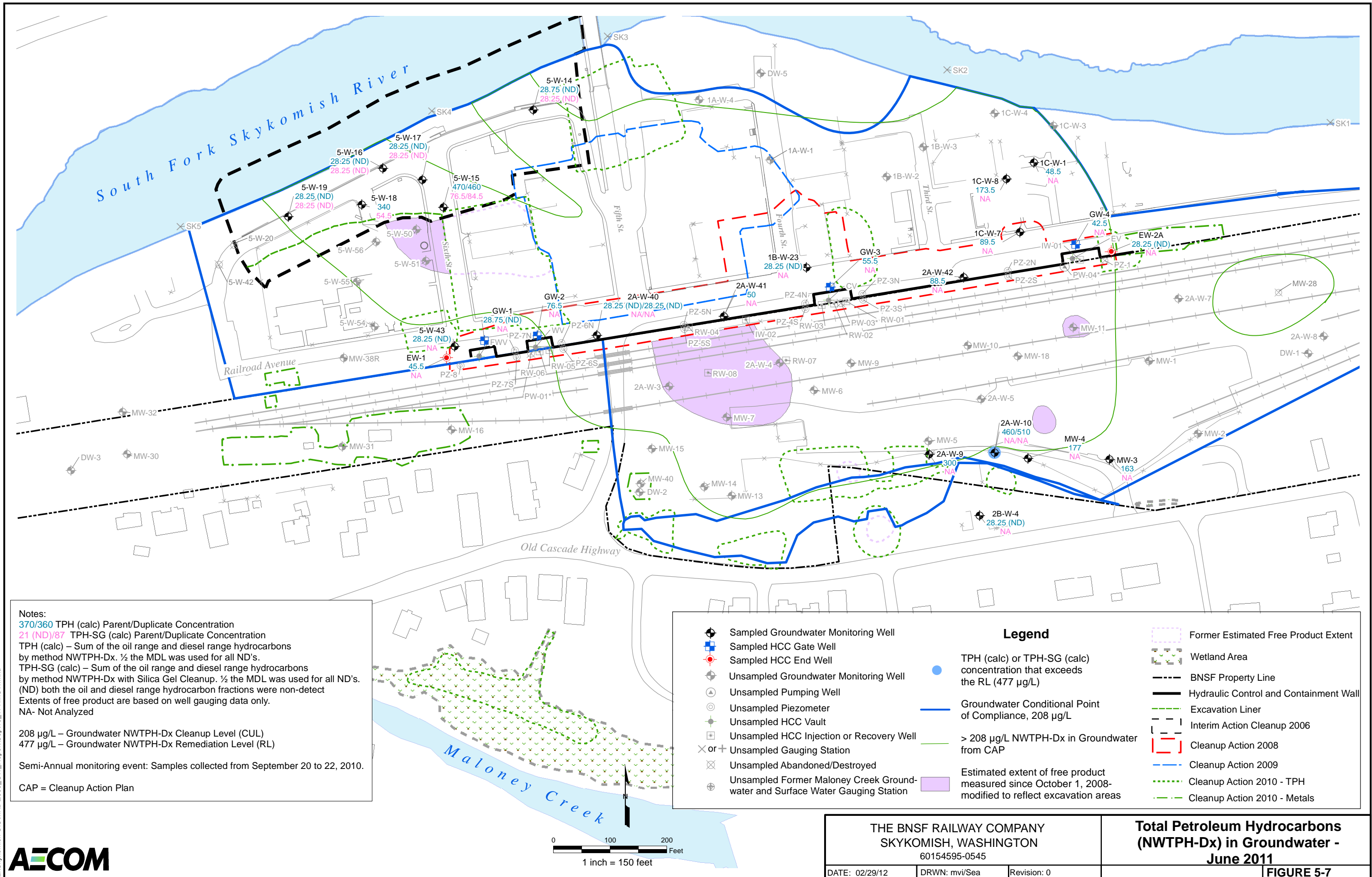
Cleanup Action 2010 - TPH

Cleanup Action 2010 - Metals

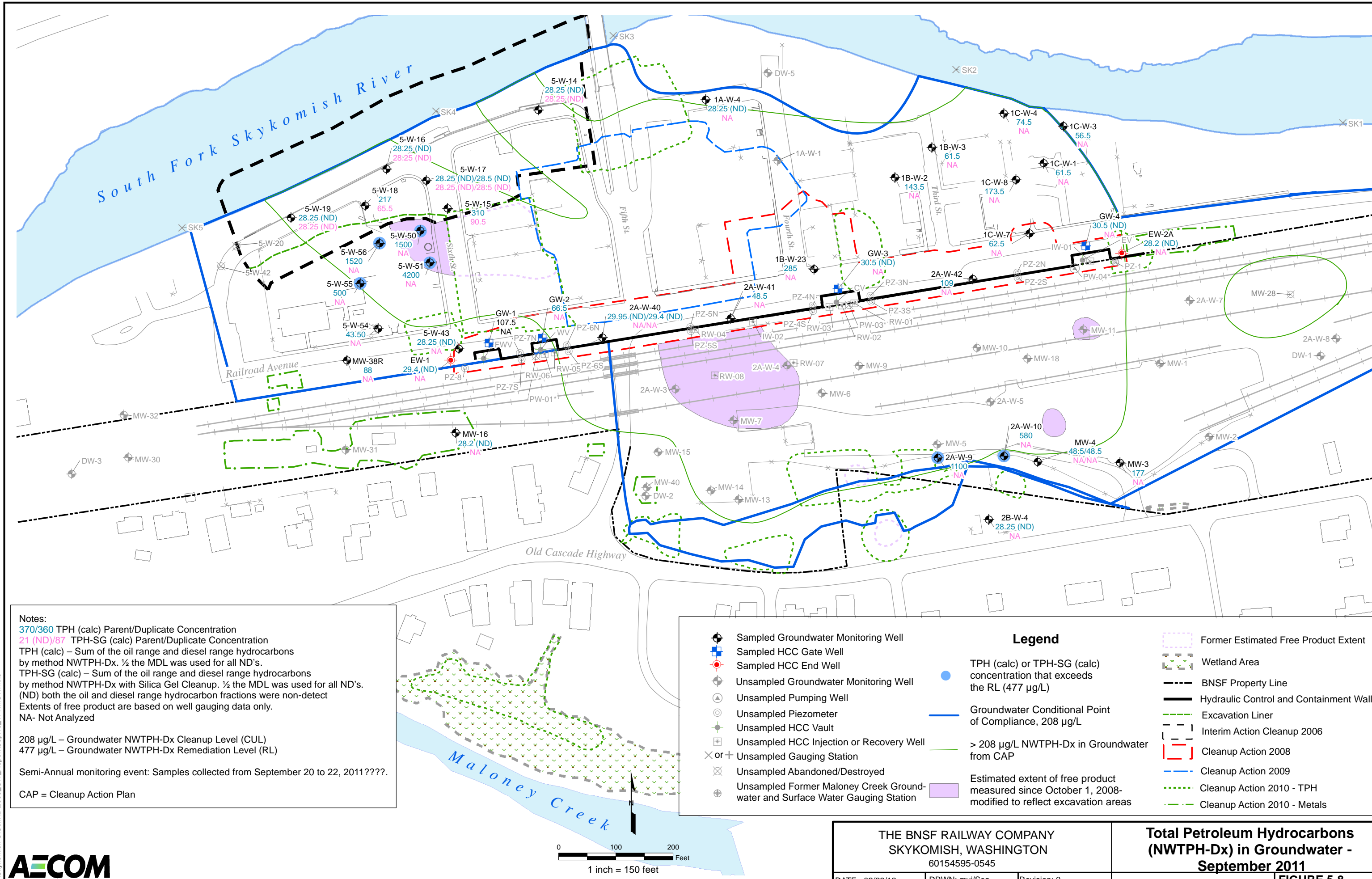


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Notes:  
370/360 TPH (calc) Parent/Duplicate Concentration  
21 (ND)/87 TPH-SG (calc) Parent/Duplicate Concentration  
TPH (calc) – Sum of the oil range and diesel range hydrocarbons by method NWTPH-Dx. ½ the MDL was used for all ND's.  
TPH-SG (calc) – Sum of the oil range and diesel range hydrocarbons by method NWTPH-Dx with Silica Gel Cleanup. ½ the MDL was used for all ND's.  
(ND) both the oil and diesel range hydrocarbon fractions were non-detect  
Extents of free product are based on well gauging data only.  
NA- Not Analyzed

208 µg/L – Groundwater NWTPH-Dx Cleanup Level (CUL)  
477 µg/L – Groundwater NWTPH-Dx Remediation Level (RL)

Semi-Annual monitoring event: Samples collected from September 20 to 22, 2011????.

CAP = Cleanup Action Plan

●

Sampled Groundwater Monitoring Well

■

Sampled HCC Gate Well

●

Sampled HCC End Well

●

Unsampled Groundwater Monitoring Well

⊙

Unsampled Pumping Well

⊙

Unsampled Piezometer

⊙

Unsampled HCC Vault

⊙

Unsampled HCC Injection or Recovery Well

⊙ or ⊕

Unsampled Gauging Station

⊗

Unsampled Abandoned/Destroyed

⊕

Unsampled Former Maloney Creek Groundwater and Surface Water Gauging Station

●

TPH (calc) or TPH-SG (calc) concentration that exceeds the RL (477 µg/L)

—

Groundwater Conditional Point of Compliance, 208 µg/L

—

> 208 µg/L NWTPH-Dx in Groundwater from CAP

■

Estimated extent of free product measured since October 1, 2008- modified to reflect excavation areas

□

Former Estimated Free Product Extent

□

Wetland Area

---

BNSF Property Line

---

Hydraulic Control and Containment Wall

---

Excavation Liner

---

Interim Action Cleanup 2006

---

Cleanup Action 2008

---

Cleanup Action 2009

---

Cleanup Action 2010 - TPH

---

Cleanup Action 2010 - Metals



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# **Appendix A**

## **Field Forms**



## **Groundwater Sampling Forms**

**(Note: the groundwater sampling forms are provided on the attached CD-ROM.)**

**CHAIN-OF-CUSTODY / Analytical Request Document**  
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

**The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.**

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: AECOM	Report To: Renee Knecht, Sarah Alban	Company Name:	Attention:	Page: 1 of 1	1391119
Address: 710 2nd Ave. Suite 1000 Seattle WA 98104	Copy To: Dean Kinney	Address:			
Email To: Sarah.alban@aecom.com	Purchase Order No.:	Pace Quote Reference:		REGULATORY AGENCY	
Phone: 206-624-9349	Project Name: SKYKEMISH BNSF	Pace Project Manager:		<input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER	
Requested Due Date/TAT: Standard	Project Number: 61054595-0540			<input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER	
			Site Location	WA	
			Pace Profile #:	STATE:	

[illegible]

2	SAMPLER NAME AND SIGNATURE		Temp In °C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Samples Intact (Y/N)
	PRINT Name of SAMPLER:		Abdullahi 'Seban			
	SIGNATURE of SAMPLER:		A. dilledani jahan			
			DATE Signed (MM/DD/YYYY): 10/26/10			

**\*Important Note:** By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07. 15-May-2007

**AECOM**

Well ID: 1C-W-1  
Sample ID: 1C-W-1-1010  
Well Condition: Good

Initial Depth to Water* (ft):	13.09
Depth to Product* (ft):	—
Product Thickness (ft):	—
Water Column (ft):	3.61
Water Volume in Well (gal):	0.59
Inner Casing Diameter (Inch):	2
Inner Casing Material:	PVC
Start Purge Time:	10:35

**PURGING INFORMATION**

Purge/Sample Method:	Low-flow
Purge/Sample Equipment:	Peristaltic Pump
Sampling Tube Material:	Polyethylene/Silicone
Screened Interval Depth Range* (ft):	5 - 16.7
Tubing Inlet Depth* (ft):	14
Total Well Depth* (feet):	16.7

[illegible]

Sample ID	Sample Time	Analysis	Method	Container	No. of Bottles	Preservative
1C-W-1-1010	1055	TPH Diesel	NWTPH-Dx W/O SGCU	1 L Amber Glass	2	HCl
		TPH Diesel	NWTPH-Dx W/ SGCU	1-L Amber Glass	2	HCl

Dissolved Oxygen: +/- 10%  
Conductivity: +/- 10%  
Temperature: +/- 10 %  
pH: +/- 0.1 unit  
Redox Potential: +/- 10%  
Turbidity: +/- 10%

purge water is clear.

1 gal = 3785.4 mL



Well ID: 1C-W-7  
Sample ID: 1C-W-7-1010  
Well Condition: Good

Initial Depth to Water* (ft):	10.84
Depth to Product* (ft):	—
Product Thickness (ft):	—
Water Column (ft):	9.96
Water Volume in Well (gal):	1.63
Inner Casing Diameter (Inch):	2
Inner Casing Material:	PVC
Start Purge Time:	12.28

Purge/Sample Method:	Low-flow
Purge/Sample Equipment:	Peristaltic Pump
Sampling Tube Material:	Polyethylene/Silicone
Screened Interval Depth Range* (ft):	10 - 20.8
Tubing Inlet Depth* (ft):	12
Total Well Depth* (feet):	20.8

[illegible]

Sample ID	Sample Time	Analysis	Method	Container	No. of Bottles	Preservative
1C-W-7-1010	1245	TPH Diesel	NWTPH-Dx W/O SGCU	1 L Amber Glass	2	HCl
		<del>TPH Diesel</del>	<del>NWTPH-Dx W/ SGCU</del>	<del>1 L Amber Glass</del>	<del>2</del>	<del>HCl</del>

Dissolved Oxygen: +/- 10%  
Conductivity: +/- 10%  
Temperature: +/- 10 %  
pH: +/- 0.1 unit  
Redox Potential: +/- 10%  
Turbidity: +/- 10%

purge water is clear.

Field parameter meter calibration results are recorded in the field book.

$$1 \text{ gal} = 3785.4 \text{ mL}$$

**AECOM**

Well ID: 1C-W-8  
Sample ID: 1C-W-8-1010  
Well Condition: Good

Initial Depth to Water\* (ft): 12.37  
 Depth to Product\* (ft): —  
 Product Thickness (ft): —  
 Water Column (ft): 5.83  
 Water Volume in Well (gal): 0.95  
 Inner Casing Diameter (Inch): 2  
 Inner Casing Material: PVC  
 Start Purge Time: 1117  
**PURGING INFORMATION**

Purge/Sample Method:	Low-flow
Purge/Sample Equipment:	Peristaltic Pump
Sampling Tube Material:	Polyethylene/Silicone
Screened Interval Depth Range* (ft):	10 - 18.2
Tubing Inlet Depth* (ft):	13.50
Total Well Depth* (feet):	18.20

[illegible]

Sample ID	Sample Time	Analysis	Method	Container	No. of Bottles	Preservative
1C-W-8-1010	1140	TPH Diesel	NWTPH-Dx W/O SGCU	1 L Amber Glass	2	HCl
		TPH Diesel	NWTPH-Dx W/ SGCU	1 L Amber Glass	2	HCl
1C-W-80-1010	1230	TPH Diesel	NWTPH-Dx	1 L Amber Glass	2	HCl

Dissolved Oxygen: +/- 10%  
Conductivity: +/- 10%  
Temperature: +/- 10 %  
pH: +/- 0.1 unit  
Redox Potential: +/- 10%  
Turbidity: +/- 10%

purge water is clear.  
collected Duplicate IC-W-80-1010 @ 1220.

Field parameter meter calibration results are recorded in the field book.

$$1 \text{ gal} = 3785.4 \text{ mL}$$

## Field Activity Log

Page:      of

**AECOM**

Project Name: Skykomish BNSF

Completed By: Abdelghani Selmane

Project Number: \_\_\_\_\_

Date: 10/26/10

Field Activity: Monthly G&W  
Sampling

Weather: rain 40°F

Personnel on site: Abdelghani Selmane

0910: Arrived to the site, signed in at AECOM and Stricker offices, met with Eric and had safety meeting.

0930: started calibrating equipment.

1000: went to buy tea.

1015: Began setting up on IC-W-1

1035: started purging, water is clear.

1045: Began recording parameters.

1055: started sampling.

1110: Began setting up on IC-W-8.

1117: started purging, water is clear.

1127: Began recording parameters.

1140: started sampling, also collected duplicate IC-W-80-1010 at 1220.

1215: Began setting up on IC-W-7.

1228: started purging, water is clear.

1238: Began recording parameters.

1245: started collecting samples.

1310: Finished sampling and started packing up and cleaning, disposed purge water into a drum at Hec building.

1400: Signed out, and left a site to the Lab.

*Abdelghani Selmane*

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: AECOM	Report To: Sarah Albano	Attention: <i>Barbara Sheppard</i>	Company Name: BAISF	Page: <i>1</i> of <i>1</i>	1338247
Address: 710 2nd Ave. Suite 1000 Seattle, WA 98104	Copy To: Renee Kaseck		Address:		
Email To: Sarah.albano@aecom.com	Purchase Order No.: P			REGULATORY AGENCY	
Phone: 206-624-9347 Fax:	Project Name: BAISF Skykomish			<input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER	
Requested Due Date/TAT: Standard	Project Number: 60154595-0540			<input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER	
			Site Location	STATE: WA	

[illegible]

2	SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	*Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	PRINT Name of SAMPLER:					
	SIGNATURE of SAMPLER:		DATE Signed (MM/DD/YY):			
	<i>Michael Gray</i> <i>Michael Gray</i>		<i>11/30/10</i> <i>11/30/10</i>			





**AECOM**

Well ID: 1C-W-8-  
Sample ID: 1C-W-8-11C  
Well Condition: Good

Purge/Sample Method:	Low-flow
Purge/Sample Equipment:	Peristaltic Pump
Sampling Tube Material:	Polyethylene/Silicone
Screened Interval Depth Range* (ft):	10 - 18.20
Tubing Inlet Depth* (ft):	14
Total Well Depth* (feet):	18.20

[illegible]

Sample ID	Sample Time	Analysis	Method	Container	No. of Bottles	Preservative
1C-W-8-1110	1240	TPH Diesel	NWTPH-Dx W/O SGCU	1 L Amber Glass	2	HCl
		TPH Diesel	NWTPH-Dx W/ SGCU	1 L Amber Glass	2	HCl
1C-W-80-1110	1300	TPH Diesel	NWTPH-Dx	1 L Amber Glass	2	HCl

purge water is clear  
collected duplicate 1C-W-80-1110 at 1300

1 gal = 3785.4 mL



Well ID: 1C-W-1  
Sample ID: 1C-W-1-1110  
Well Condition: Good

Initial Depth to Water\* (ft): 13.54  
 Depth to Product\* (ft): —  
 Product Thickness (ft): —  
 Water Column (ft): 3.16  
 Water Volume in Well (gal): 0.52  
 Inner Casing Diameter (Inch): 2  
 Inner Casing Material: PVC  
 Start Purge Time: 1134  
**PURGING INFORMATION**

Purge/Sample Method:	Low-flow
Purge/Sample Equipment:	Peristaltic Pump
Sampling Tube Material:	Polyethylene/Silicone
Screened Interval Depth Range* (ft):	10 - 16 + 70
Tubing Inlet Depth* (ft):	15
Total Well Depth* (feet):	16-70

[illegible]

Sample ID	Sample Time	Analysis	Method	Container	No. of Bottles	Preservative
1C-W-1-1110	1155	TPH Diesel	NWTPH-Dx W/O SGCU	1 L Amber Glass	2	HCl
		<del>TPH Diesel</del>	<del>NWTPH-Dx W/ SGCU</del>	<del>1 L Amber Glass</del>	<del>2</del>	<del>HCl</del>

Dissolved Oxygen: +/- 10%  
Conductivity: +/- 10%  
Temperature: +/- 10 %  
pH: +/- 0.1 unit  
Redox Potential: +/- 10%  
Turbidity: +/- 10%

purge water is clear.

\* = Measured from top of inner casing

Initial purge 15 minutes, then measure at 3 minute intervals

### Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

4" casing: 1 ft = 0.656 gal = 2.48 L

1 gal = 3785.4 mL

## Field Activity Log

Page:      of

**AECOM**

Project Name: BNISF Skykomish

Completed By: Abdelghani Selham

Project Number: 61054595-0540

Date: 11/30/10

Field Activity: Monthly GW

Weather: Snow 30°F

Sampling

Personnel on site: Ehmani Selham

1015: Arrived to the site, signed in at AECOM Trailer office  
I met with Waman.

1030: Started calibrating equipment YSI and turbidity meter.

1110: Began setting up IC-W-1.

1134: Started purging, water is clear.

1144: Began recording parameters.

1155: Started sampling.

1210: Began setting up on IC-W-8.

1219: Started purging, water is clear.

1229: Began recording parameters.

1240: started sampling, also collected duplicate IC-W-80  
at 1300.

1335: Began setting up on IC-W-7.

1355: Started purging, water started with some Iron Flakes.

1405: Began recording parameters.

1415: Started sampling.

1430: Finished sampling, packed up, cleaned up  
disposed a purge water into a drum in the building.

1515: left a site to Seattle.

Abdelghani Selham

## AECOM ENVIRONMENT

## FIELD ACTIVITY LOG

PROJECT BNSF - SkykomishCOMPLETED BY D. KinneyJOB NO. 60154595-0540

APPROVED BY \_\_\_\_\_

DAY & DATE Tues Dec 14th 2010SHEET 1 OF 1

## FIELD ACTIVITY SUBJECT:

## DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Groundwater gauging & sampling

TIME	
0745	D. Kinney arrive onsite & unloaded sample coolers at bunkhouse
0800	At office trailer, Fred & Mindy onsite had safety mtg & discussed site work
0840	Setting up to gauge
0920	Started gauging
1125	Lunch
1200	Returned & started gauging
1330	Setup to sample, calibrated VSI (model 536) & Pakton (model T-100) meters
1350	Started purging IC-W-1
1415	Sampled IC-W-1 for NWTPH-DX
1420	Started purging IC-W-8
1445	Sampled IC-W-8 (same as IC-W-1)
1510	Went to city & asked about morning snow to locate 5-W-43
1600	Located 5-W-43
1611	Started purging 5-W-43
1630	Sampled 5-W-43 (same as IC-W-1)
1700	Put equipment & samples in bunkhouse
1735	Left site

## VISITORS ON SITE:

None

## CHANGES FROM PLANS OR IMPORTANT DECISIONS:

None

## WEATHER CONDITIONS:

cloudy to raining,  
35-40 °F

## IMPORTANT TELEPHONE CALLS:

Called Sarah Albano (PM) about  
EW-1 well condition -  
we will sample well anyway

## PERSONNEL ON SITE:

Dean Kinney, Fred Merrill & Mindy Graddon

## AECOM ENVIRONMENT

## FIELD ACTIVITY LOG

PROJECT BNSF - Skykomish  
 JOB NO. 60154595 - 0540  
 DAY & DATE Weds. Dec. 15<sup>th</sup>, 2000

COMPLETED BY D. Kinney  
 APPROVED BY \_\_\_\_\_  
 SHEET 1 OF 2

## FIELD ACTIVITY SUBJECT:

## DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

GW Sampling

TIME	
0650	D. Kinney onsite & calibrating meters (VSI & Oaktown)
0715	Safety mtg w/ Mindy
0735	Loading equipment & supplies
0828	Started purging 2A-W-9
0850	Sampled 2A-W-9 for NWTPH-DX
0915	Started purging 2A-W-10
0935	Sampled 2A-W-10 for NWTPH-DX
0946	Started purging MW-4
1015	Sampled MW-4 for NWTPH-DX
1036	Started purging MW-3
1115	Sampled MW-3 for NWTPH-DX, took duplicate, labeled: MW-30-1246
1130	Pump purge water at HCR Bldg & dropped Gull cooler at bunkhouse
1145	Lunch
1210	Returned from lunch & had to pump water around GW-1
1229	Started purging GW-1
1250	Sampled GW-1 for NWTPH-DX
1331	Started purging 2A-W-41 after pumping water out of area around monument
1400	Sampled 2A-W-42 for NWTPH-DX

## VISITORS ON SITE:

None

## CHANGES FROM PALNS OR IMPORTANT DECISIONS:

None

## WEATHER CONDITIONS:

Snowing to Raining  
30 -

## IMPORTANT TELEPHONE CALLS:

None

## PERSONNEL ON SITE:

Dean Kinney, Mindy Graddon



## FIELD ACTIVITY LOG

COMPLETED BY D. Kinney

APPROVED BY \_\_\_\_\_

SHEET 2 OF 2

## GW Sampling

<b>VISITORS ON SITE:</b> None	<b>CHANGES FROM PALNS OR IMPORTANT DECISIONS:</b> None
<b>WEATHER CONDITIONS:</b> Snowing to Raining, 35-40°F	<b>IMPORTANT TELEPHONE CALLS:</b> None
<b>PERSONNEL ON SITE:</b> See pg. 1	

## FIELD ACTIVITY LOG

COMPLETED BY D. K. Jones

APPROVED BY \_\_\_\_\_

SHEET 1 OF 1

## GW Sampling

PERSONNEL ON SITE: Dean Kiley, Mindy Gaddon



## Field Activity Log

Page: 1 of 1

Project Name: Skylconish BNSF

Completed By: M. Graddon

Project Number:

Date: 12/14/10

Field Activity: Flow Gauging & sampling

Weather: Rainy / Snowy Mix

Personnel on site: F. Merrill, D. Kinney, M. Graddon

0800 AECOM onsite to discuss scope of work & have H&S meeting discussing site hazards and task hazards.

0845 Organize equipment & supplies. Move coolers to house.

0900 Begin gauging with F. Merrill (product wells first). See fluid level gauging form for more details.

1315 Set up at 1C-W-7. Calibrated YSI & Turbidity meter.

1400 Begin purging at 1C-W-7.

1420 Collect samples from 1C-W-7 labeled as 1C-W-7-1210.

1500 Begin purging 2B-W-4.

1525 Collect samples from 2B-W-4 labeled as 2B-W-4-1210.

1600 Begin purging 2A-W-40.

1620 Collect samples from 2A-W-40 labeled as 2A-W-40-1210. All samples analyzed for NUTPH<sub>3</sub> and sampled using clean new tubing.

1635 Clean up work area, equipment, supplies. Empty purge water into 55 gallon drums (approx. 7 gallons).

1720 Store equipment at house - get empty coolers from house to transport ice.

1735 M. Graddon offsite.

*Mindy Graddon*





## Field Activity Log

Page: 1 of

Project Name: Slykenish

Completed By: M. Graddon

Project Number: 60154555

Date: 12/15/10

Field Activity: GWS

Weather: Rainy / Snowy mix. 30°F's

Personnel on site: M. Graddon, D. Kinney

0720 AECOM onsite. Have H&S meeting and discuss scope of work.

0745 Go to Bunk house to get equipment and drop off ice, organize supplies & sample bottles.

0815 Set up at EW-1 - snow pile between road and well.

~~0805~~ B 0845 Calibrate YSI and turbidity meter.

0905 Begin purging EW-1

0935 Collect samples from EW-1 labeled as EW-1-1210.

1030 Begin purging GW-2.

1115 Collect samples from GW-2 labeled as GW-2-1210. Duplicate sample collected and labeled as GW-20-1210 sample time as "1015"

1230 Begin purging 2A-W-41.

1300 Collect samples from 2A-W-41 labeled as 2A-W-41-1210

1330 Begin purging GW-3.

1355 Collect samples from GW-3 labeled as GW-3-1210.

1415 Drop off purge water (approx. 8 gallons).

1430 Set up at 1B-W-23

1445 Begin purging 1B-W-23

1520 Collect samples from 1B-W-23 labeled as 1B-W-23-1210.

1555 Begin purging GW-4.

1615 Collect samples from GW-4 labeled as GW-4-1210.

1635 Put sample & purge water into 55 gallon drum @ the building

1645 Put equipment & coolers in Bunk House. Re-ice samples. Organize coolers for tomorrow.

1730 M. Graddon offsite.

*Mindy Graddon*



## Field Activity Log

Page: 1 of 1

Project Name: Skykanish

Completed By: M. Gradden

Project Number: 60154895

Date: 12/16

Field Activity: GWS

Weather: Partly cloudy, cold, icy ~39°F

Personnel on site: M. Gradden, D. Kinney

0720 AECOM onsite - Have H&S meeting & discuss scope of work.

0735 Go to bunkhouse to organize coolers, samples and equipment.

0800 Set up at S-W-19. Calibrate YSI and turbidity meter.

0823 Begin purging S-W-19.

0850 Collect sample from S-W-19 labeled as S-W-19-1210

0928 Begin purging S-W-14 to 15

0945 Collect sample from S-W-14 labeled as S-W-14-1210

1018 Begin purging S-W-15

1035 Collect sample from S-W-15 labeled as S-W-15-1210

Duplicate sample "0935" labeled as S-W-150-1210

1100 Clean up, pack up equipment, drop off purge water, pack & re-pack coolers, organize.

1215 AECOM offsite

M. Gradden

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 12/15/10

Well No. MW-3  
Sampled By DWK  
weather Rainy, 35°F

WELL INFORMATION		
Depth to water	6.27	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	none	(ft)
Screen interval:		
well condition:	ok	

COMMENTS
Tubing inlet at ~7.0'

PURGE DATA							
start purge time	1036						
time		1046	1049	1052			
DTW	(ft)	0.25	6.48	6.49			
purge rate	(L/min)	0.46	0.20	0.20			
pH	(Units)	5.75	5.73	5.73			
conductivity	(umhos/cm)	0.178	0.179	0.180			
temperature	(deg C)	4.7	4.7	4.6			
D.O.	(mg/L)	6.54	6.56	6.61			
ORP	(mv)	152	153	154			
turbidity	(NTU)	0.82	0.79	0.74			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
MW-3-1210	1100	NWTPH-Dx	1L Gl. Amber	2	HCl
MW-3D-1210 (Duplicate)	1115	"	"	"	"



































# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 12/16/10

Well No. 5-W-15  
Sampled By MG  
weather Sunny 34°F

WELL INFORMATION	
Depth to water	6.54 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	— (ft)
Screen interval:	
well condition:	OK

COMMENTS
Duplicate sample collected: 5-W-15D-1210
started purging rust-colored water then quickly cleared up. Moderate HC color.

PURGE DATA							
start purge time	1018						
time		1028	1031	1034			
DTW	(ft)	6.65	6.66	6.66			
purge rate	(L/min)	.35	.35	.35			
pH	(Units)	6.84	6.85	6.85			
conductivity	(umhos/cm)	232	234	233			
temperature	(deg C)	8.15	8.15	8.00			
D.O.	(mg/L)	0.64	0.61	0.66			
ORP	(mv)	-66.2	-68.2	-67.7			
turbidity	(NTU)	41.8	38.0	37.9			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
5-W-15-1210	1035	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl
5-W-15D-1210	0935	"	"	"	"
(Dup)		"	"	"	"



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 12/16/10

Well No. 5-W-16  
Sampled By DWK  
weather cloudy, 30 °F

WELL INFORMATION	
Depth to water	6.86 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	none (ft)
Screen interval:	
well condition:	ok

COMMENTS
Extra sample volume for lab RC
Tubing inlet at ~ 7.5'

PURGE DATA							
start purge time	0904						
time		0914	0917	0920	0923		
DTW	(ft)	6.86					
purge rate	(L/min)	0.35					
pH	(Units)	6.35	6.39	6.44	6.47		
conductivity	(umhos/cm)	0.169	0.175	0.179	0.183		
temperature	(deg C)	6.8	6.8	6.8	6.8		
D.O.	(mg/L)	3.37	3.25	3.19	3.16		
ORP	(mv)	217	213	210	207		
turbidity	(NTU)	2.36	1.68	1.77	1.59		
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
5-W-16-1210	0930	NWTPH-Dx (w/SGCU)	1L Gl. Amber	3	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 12/16/10

Well No. 5-W-17  
Sampled By DWK  
weather cloudy, 30 °F

WELL INFORMATION	
Depth to water	6.19 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	none (ft)
Screen interval:	
well condition:	ok

COMMENTS
Tubing inlet at ~ 7.0 feet

PURGE DATA							
start purge time	0820						
time		0830	0833	0836			
DTW	(ft)	6.20					
purge rate	(L/min)	0.30					
pH	(Units)	5.96	5.93	5.88			
conductivity	(umhos/cm)	0.063	0.063	0.063			
temperature	(deg C)	7.1	7.1	7.1			
D.O.	(mg/L)	5.27	5.15	5.09			
ORP	(mv)	745	748	752			
turbidity	(NTU)	0.65	0.61	0.59			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
5-W-17-1210	0840	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date

12/15/10

Well No.

5-W-18

Sampled By

DW/K

weather

Cloudy, 35°F

## WELL INFORMATION

Depth to water 6.00 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: None (ft)  
 Screen interval:  
 well condition: ok

## COMMENTS

Tubing inlet at ~6.75'

## PURGE DATA

start purge time	1548							
time		1558	1601	1604	1607			
DTW (ft)		6.01						
purge rate (L/min)		0.30						
pH (Units)		6.67	6.65	6.65	6.65			
conductivity (umhos/cm)		0.233	0.232	0.232	0.231			
temperature (deg C)		6.5	6.5	6.5	6.5			
D.O. (mg/L)		4.13	4.10	4.07	4.04			
ORP (mv)		99	98	97	96			
turbidity (NTU)		2.82	1.61	1.58	1.69			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-18-1210	1610	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 12/16/10

Well No. 5-W-19

Sampled By MGA

weather Partly Cloudy 39 °F

## WELL INFORMATION

Depth to water 6.22 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: — (ft)  
 Screen interval:  
 well condition: ok

## COMMENTS

## PURGE DATA

start purge time	0823							
time		0833	0836	0839	0842	0845		
DTW	(ft)	6.23	6.23	6.23	6.23	6.23		
purge rate	(L/min)	.3	.3	.3	.3	.3		
pH	(Units)	6.39	6.37	6.35	6.34	6.33		
conductivity	(umhos/cm)	42	41	40	40	39		
temperature	(deg C)	6.46	6.44	6.47	6.45	6.46		
D.O.	(mg/L)	5.28	5.24	5.19	5.12	5.16		
ORP	(mv)	175.4	175.3	175.2	174.7	174.8		
turbidity	(NTU)	2.09	1.51	0.80	0.75	0.68		
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-19-1210	0850	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
5-W-19-1210	0850	NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 12/15/10

Well No. S-W-20

Sampled By phk

weather Rainy, 35°F

## WELL INFORMATION

Depth to water 5.46 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: none (ft)  
 Screen interval:  
 well condition: ok

## COMMENTS

Tubing inlet at ~ 6.0'

## PURGE DATA

start purge time	1411							
time		1421	1424	1427	1430	1433		
DTW	(ft)	5.47						
purge rate	(L/min)	0.30						
pH	(Units)	6.53	6.54	6.55	6.56	6.56		
conductivity	(umhos/cm)	0.256	0.256	0.256	0.256	0.256		
temperature	(deg C)	6.7	6.7	6.8	6.8	6.8		
D.O.	(mg/L)	1.68	1.65	1.61	1.56	1.51		
ORP	(mv)	133	130	126	121	118		
turbidity	(NTU)	4.81	3.36	3.11	2.95	2.83		
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
S-W-20-1210	1435	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

0 F

[illegible]

		PURGE DATA					
start purge time		1505					
time		1515	1518	1521	1524	1527	
DTW	(ft)	5.38					
purge rate	(L/min)	0.30					
pH	(Units)	6.48	6.46	6.44	6.41	6.41	
conductivity	(umhos/cm)	0.088	0.089	0.089	0.091	0.094	
temperature	(deg C)	7.8	7.9	7.9	7.9	7.9	
D.O.	(mg/L)	3.72	3.71	3.68	3.65	3.53	
ORP	(mv)	142	124	131	129	129	
turbidity	(NTU)	9.78	7.65	4.81	4.59	4.46	
purge and sample equip.		Peristaltic pump and silicone/polyethylene tubing					

[illegible]



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 12/14/10

Well No. 5-W-43  
Sampled By DWK  
weather Cloudy, 35°F

WELL INFORMATION	
Depth to water	4.42 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	None (ft)
Screen interval:	
well condition:	ok

COMMENTS
Tubing inbt at ~5.0'

PURGE DATA							
start purge time	1611						
time		1621	1624	1627			
DTW	(ft)	4.42					
purge rate	(L/min)	0.30					
pH	(Units)	5.46	5.48	5.52			
conductivity	(umhos/cm)	0.089	0.091	0.095			
temperature	(deg C)	8.0	8.2	8.2			
D.O.	(mg/L)	2.16	2.11	2.09			
ORP	(mv)	211	218	224			
turbidity	(NTU)	1.49	1.37	1.44			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
5-W-43-1210	1630	NWTPH-Dx	1L Gl. Amber	2	HCl

conductivity reading fluctuating







# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 12/15/10

Well No. GW-2  
Sampled By MG  
weather Rainy/Snowy mix 39 °F

## WELL INFORMATION

Depth to water 9.76 (ft)  
Depth of well: (ft)  
Well diameter: 2 (in)  
Feet of water: (ft)  
Product thickness: — (ft)  
Screen interval:  
well condition: OK

## COMMENTS

1054 Storm water leaking in - bailed  
out water - let parameters stabilize  
DTW & purge rate stayed constant

## PURGE DATA

start purge time	1030							
time		1040	1043	1045	1048	1051	1054	
DTW	(ft)	9.72	9.72	9.72	9.72	9.72	9.72	
purge rate	(L/min)	.2	.2	.2	.2	.2	.2	
pH	(Units)	6.44	6.47	6.48	6.50	6.51	6.50	
conductivity	(umhos/cm)	79	81	82	84	84	86	
temperature	(deg C)	8.53	8.52	8.54	8.51	8.35	8.42	
D.O.	(mg/L)	1.04	1.28	1.39	1.42	1.81	1.85	
ORP	(mv)	12.1	11.9	12.6	14.9	20.9	24.7	
turbidity	(NTU)	3.27	3.65	3.84	6.50	10.23	18.22	
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
GW-2-1210	1115	NWTPH-Dx	1L Gl. Amber	2	HCl
GW-2D-1210 (Duplicate)	1015	✓	✓	✓	✓

time	1100	1103	1106	1109	1112
pH	6.48	6.49	6.48	6.47	6.47
Cond.	90	93	93	94	94
Temp	8.53	8.50	8.50	8.50	8.54
D.O.	1.76	1.87	1.86	1.85	1.83
ORP	28.7	33.5	36.6	38.4	40.1
turbid	7.24	7.40	7.83	7.75	8.29









# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

## Section A

Required Client Information:

Company:

Address:

710 72nd Ave SW

Seattle, WA 98104

Email To:

Phone:

Requested Due Date/TAT:

## Section B

Required Project Information:

Report To:

Copy To:

Purchase Order No.:

Project Name:

Project Number:

Project Name:

Project Number:

## Section C

Invoice Information:

Attention:

Company Name:

Address:

Reference:

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1438205

REGULATORY AGENCY

NPDES ☒ GROUND WATER ☐ DRINKING WATER

UST ☐ RCRA ☐ OTHER ☐

Site Location

STATE:

WA

Requested Analysis Filtered (Y/N)

Requested Analysis Filtered (Y/N)

Requested Analysis Filtered (Y/N)

Requested Analysis Filtered (Y/N)

Requested Analysis Filtered (Y/N)

Requested Analysis Filtered (Y/N)

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Requested Analysis Filtered (Y/N)

Requested Analysis Filtered (Y/N)

Requested Analysis Filtered (Y/N)

Requested Analysis Filtered (Y/N)

Residual Chlorine (Y/N)

Pace Project No./ Lab I.D.

SAMPLE CONDITIONS

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

\*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

## Section A

Required Client Information:

Company: AECOM  
Address: 710 704 Ave Ste 1000  
Seattle, WA 98104  
Email To: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
Requested Due Date/TAT: Std

## Section B

Required Project Information:

Report To: Sarah Albano  
Copy To: Renee Knecht  
Purchase Order No.: TT0100-739  
Project Name: BNSF-Skykomish  
Project Number: 60154595-0540

## Section C

Invoice Information:

Attention: Bruce Sheppard  
Company Name: BNSF  
Address: \_\_\_\_\_  
Page Quote Reference: \_\_\_\_\_  
Page Project Manager: \_\_\_\_\_  
Page Profile #: \_\_\_\_\_

Page: 2 of 3

1438201

## REGULATORY AGENCY

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER  
☐ UST ☐ RCRA ☐ OTHER \_\_\_\_\_

Site Location  
STATE: WA

## Section D

Required Client Information

**SAMPLE ID**  
(A-Z, 0-9 / . -)  
Sample IDs MUST BE UNIQUE

Matrix Codes  
MATRIX / CODE

Drinking Water DW  
Water WT  
Waste Water WW  
Product P  
Soil/Solid SL  
Oil OL  
Wipe WP  
Air AR  
Tissue TS  
Other OT

MATRIX CODE (see valid codes to left)

SAMPLE TYPE (G=GRAB C=COMP)

DATE TIME DATE TIME

COMPOSITE START COMPOSITE END/GRAB

SAMPLE TEMP AT COLLECTION

# OF CONTAINERS

Unpreserved  
H<sub>2</sub>SO<sub>4</sub>  
HNO<sub>3</sub>  
HCl  
NaOH  
Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>  
Methanol  
Other

Analysis Test ↓

NWTPH-Dx W/SGC  
NWTPH-Dx W/SGC

Requested Analysis Filtered (Y/N)

Residual Chlorine (Y/N)

Pace Project No./ Lab I.D.

ITEM #	REQUIRED CLIENT INFORMATION	MATRIX CODE	SAMPLE TYPE	DATE	TIME	DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	UNPRESERVED	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other	ANALYSIS TEST ↓	REQUESTED ANALYSIS FILTERED (Y/N)	RESIDUAL CHLORINE (Y/N)	PACE PROJECT NO./ LAB I.D.
1	2A-W-42-1210			12/15/10	1400	8	2		2												
2	S-W-20			12/15/10	1435	3	4		4												
3	S-W-42			12/15/10	1530	8	4		4												
4	S-W-18			12/15/10	1610	7	4		4												
5	EW-1			12/15/10	1635	6	2		2												
6	GW-2			12/15/10	1115	9	2		2												
7	GW-20			12/15/10	1015	9	2		2												
8	2A-W-41			12/15/10	1300	8	2		2												
9	GW-3			12/15/10	1355	7	2		2												
10	1B-W-23			12/15/10	1520	8	2		2												
11	GW-4			12/15/10	1615	8	2		2												
12	S-W-19			12/16/10	0850	7	4		4												

ADDITIONAL COMMENTS

RELINQUISHED BY / AFFILIATION

DATE

TIME

ACCEPTED BY / AFFILIATION

DATE

TIME

SAMPLE CONDITIONS

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

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Samples Intact (Y/N)

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Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

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Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

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Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

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Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

Temp in °C

CHAIN-OF-CUSTODY / Analytical Request Document  
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

1390944

Section A Required Client Information: Section B Required Project Information: Section C Invoice Information:

Company:	Address:	Report To:	Copy To:	Attention:	Company Name:	REGULATORY AGENCY
AECOM	710 2nd AVE 4th 10th	Sarah Albano	Renee Knecht	Bruce Sheppard	BNSF	NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER
Email To:	Purchase Order No.:	Address:	Address:	Reference:	Reference:	UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER <input type="checkbox"/>
Seattle, WA 98144	IT0100-539					
Phone:	Project Name:	Pace Quote	Pace Project	Site Location	STATE:	
	BNSF-Skykomish				WA	
Requested Due Date/TAT:	Project Number:	Pace Profile #:				
STJ	60154595-0540					

Section D Required Client Information		Matrix Codes MATRIX / CODE		COLLECTED		SAMPLE TEMP AT COLLECTION		# OF CONTAINERS		Preservatives		Analysis Test		Requested Analysis Filtered (Y/N)		Residual Chlorine (Y/N)		Pace Project No./ Lab I.D.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
ITEM #	SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE	Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Tissue Other	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	DATE	TIME	DATE	TIME	Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other	↓ Analysis Test ↓	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Extra sample provided ST 272		12/16/10	1430	Sybil Day	12/16/10	1430	Y N Y
at 5-W-16-1220 for							
to be ac							

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER:	DATE Signed (MM/DD/YY):
SIGNATURE of SAMPLER:	12/16/10
Temp in °C	
Received on Ice (Y/N)	
Custody Sealed Cooler (Y/N)	
Samples Intact (Y/N)	



## Fluid Level Gauging Form

Project Name:

Project Number:

Collected by:

BNSF Skykomish  
60154595-0540  
D. Kinney / E. Merrill / M. Graddon

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010		6/29/2010		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
1A-W-36	12/4/12	—	—	NM	—	—	—	NM		NM		—	Not Installed
1A-W-37	—	—	—	NM	—	—	—	NM		NM		—	Not Installed
1A-W-38	—	—	—	NM	—	—	—	NM		NM		—	Not Installed
1B-W-23	—	1250	—	1479	None	None	W/L	16.52		16.85		FM/MG	Not Installed
1B-W-24	—	—	—	NM	—	—	—	NM		NM		—	Not Installed
1C-W-1	—	1345	—	10.98	None	None	W/L	13.63		13.03		DW/L	
1C-W-7	—	1315	—	2.70	—	—	—	11.52		10.86		M/G	
1C-W-8	—	1416	—	10.29	—	—	—	12.98		12.36		DW/L	
2A-W-5	—	1036	—	9.34	—	—	—	13.95		12.62		—	
2A-W-7	—	1124	—	8.63	—	—	—	11.81		11.04		—	
2A-W-8	—	1052	—	10.37	—	—	—	15.00		14.31		—	
2A-W-9	—	0955	—	7.35	—	—	—	11.41		9.79		—	
2A-W-10	—	0958	—	7.64	—	—	—	11.54		9.71		—	
2A-W-40	—	1239	—	9.48	—	—	—	12.42		11.78		—	
2A-W-41	—	1241	—	13.54	—	—	—	17.14		16.34		—	
2A-W-42	—	1321	—	9.70	—	—	—	9.65		12.08		DW/L	
2B-W-4	—	1004	—	0.32	—	—	—	3.81		2.79		—	
5-W-14	—	1212	—	6.49	—	—	—	9.19		8.34		FM/MG	
5-W-15	—	1217	—	6.18	—	—	—	7.75		7.10		—	
5-W-16	—	1218	—	5.53	—	—	—	8.02		7.15		—	
5-W-17	—	1215	—	4.84	—	—	—	7.35		6.52		—	
5-W-18	—	1220	—	5.04	—	—	—	7.52		6.69		—	
5-W-19	—	1222	—	5.98	—	—	—	7.44		6.52		—	
5-W-20	—	1224	—	4.57	—	—	—	7.00		6.17		—	
5-W-42	—	1216	—	4.62	—	—	—	6.75		6.19		—	
5-W-43	—	1535	—	4.42	—	—	—	NM		6.91		DW/L	
5-W-44	—	—	—	NM	—	—	—	NM		NM		—	Not Installed

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010				6/29/2010				Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
MW-1	12/14/10	10:21		9.11	NONE	NONE	W/L	13.09		11.99						DWK	
MW-2		09:48		7.99				12.70		11.49							
MW-3		09:51		5.83				10.78		9.24							
MW-4		09:54		6.18				10.12		8.48							
MW-5		10:00		4.52				8.19		6.79							
MW-9		10:09		9.46				13.32		12.91							
MW-10		10:19		11.44				13.10		12.24							
MW-11		10:27		9.25				13.73		12.61							
MW-12				NM				NM		6.03							Well abandoned
MW-12R				NM				NM		NM							Not Installed
MW-13		09:42		6.96	NONE	NONE	W/L	10.31		10.18							
MW-14		09:46	13.5	8.92				12.28		12.09							
MW-15		09:20		10.02				13.52		13.18							
MW-16		11:15		10.67				13.57		13.71							
MW-18		10:34		10.91				15.10		14.06							
MW-38R		12:00	15.44	2.42				9.19		4.42							
MW-40		09:32		9.51				12.98		12.72							
2B-W-45				NM				NM		11.32							Well abandoned
2B-W-46				NM				NM		11.32							Well abandoned
2B-W-47				NM				NM		NM							Not Installed
2B-W-48				NM				NM		NM							Not Installed

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010		6/29/2010		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
EW-1	12/14/10	1235	-	6.45	None	None	W/L	9.55		11.92		DMK	Well ID & Cap off casing
EW-2		-	-	NM	-	-	-	NM		NM		-	Not Installed
GW-1				6.18	None	None	W/L	9.83		9.05		ES	
GW-2				8.68				12.39		11.62			
GW-3				13.89				15.73		15.75			
GW-4				9.03				10.25		9.46			
PZ-1R				NM				10.20					
PZ-2N								11.63					
PZ-2S								9.83					
PZ-3N								13.97					
PZ-3S								10.38					
PZ-4N								14.64					
PZ-4S								11.79					
PZ-5N								10.24					
PZ-5S	12/14/10	1115			6.55	0.25	TP/PP	9.93				FM/NG	
PZ-6N								13.29					
PZ-6S	12/14/10	1055				Hwy TR	TP	8.53				FM/NG	
PZ-7N								12.40					
PZ-7S								9.08					
PZ-8								10.20					



PAGE 4

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010		6/29/2010		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-3	12/14/10	1010	-	7.40	3.50	0.10	DP/TP	10.95	Hvy TR	11.81	Hvy TR	FM/MS	
MM-7	09/18		-	9.42	None	None	TP	13.23	None	13.10	None		
2A-W-11			-	NM				NM		7.86	Hvy TR		Well abandoned
MM-28		1038	-	10.22	None	None	TP	14.55	None	13.64	TR		
MM-39			-	NM				NM		9.23	TR		Well abandoned
2A-W-4		1025		3.52	None	None	TP	10.76	Hvy TR	11.36	Hvy TR		
5-W-3			-	NM				NM		NM			Well abandoned
MM-22			-	NM				NM		NM			Well abandoned

Other Notes:

☒ dirty casing, possible trace product  
☐ dirty well

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

## FIELD ACTIVITY LOG

COMPLETED BY O. Kinney

APPROVED BY \_\_\_\_\_

SHEET OF

**DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:**

GW sampling, Air monitoring

TIME	
0730	Arrived & setup for air monitoring
0740	HQS mtg
0800	Started air sampler at Joseph's House monitor read -29.14 Hg when valve was opened
0810	Calibrating VSI (model 556) + Dakota (model T-100) meters
0840	Started purging IC-W-7
0905	Sampled IC-W-7 for NWTPH-DX; took duplicate sample; labeled IC-W-7D-0111
0943	Started purging IC-W-1
1000	Sampled IC-W-1 for NWTPH-DX
1026	Started purging IC-W-8
1050	Sampled IC-W-8 for NWTPH-DX
1115	Dumped purge water at treatment bldg
1145	Packed equipment away
1155	Left site for lab
VISITORS ON SITE:	
<i>None</i>	
CHANGES FROM PALNS OR IMPORTANT DECISIONS:	
<i>None</i>	
WEATHER CONDITIONS:	
<i>Cloudy, 35-40°F</i>	
IMPORTANT TELEPHONE CALLS:	
<i>None</i>	
PERSONNEL ON SITE:	
<i>Dean Kinney</i>	

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 1/26/11

Well No. 1C-W-7  
Sampled By DWK  
weather Cloudy, 35 °F

WELL INFORMATION		
Depth to water	10.43	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	None	(ft)
Screen interval:		
well condition:		

COMMENTS
Tubing inlet at ~11.0'

PURGE DATA							
start purge time	0840						
time		0850	0853	0856	0859	0902	
DTW	(ft)	10.44					
purge rate	(L/min)	0.150					
pH	(Units)	4.21	4.28	4.31	4.34	4.35	
conductivity	(umhos/cm)	0.079	0.076	0.079	0.081	0.081	
temperature	(deg C)	6.2	6.2	6.2	6.2	6.2	
D.O.	(mg/L)	1.75	1.69	1.67	1.66	1.64	
ORP	(mv)	203	213	215	215	216	
turbidity	(NTU)	9.26	1.89	0.65	0.69	0.61	
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
1C-W-7-0111	0905	NWTPH-Dx	1L Gl. Amber	2	HCl
1C-W-7-0111	0920	"	"	"	"
(Duplicate)					











## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	BNSF	Report To:	Sarah Albano (A-10A)	Attention:	Buck Sheppard
Address:		Copy To:	Renee Knecht	Company Name:	BNSF
				Address:	
Email To:		Purchase Order No.:	116120 - T39	Pace Quote Reference:	
Phone:	Fax:	Project Name:	BNSF - Skykomish	Pace Project Manager:	
Requested Due Date/TAT:	5/1	Project Number:	60154595	Pace Profile #:	

[illegible]

<div style="text-align: center; font-size: 2em; color: red;">2</div>	<b>SAMPLER NAME AND SIGNATURE</b>		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	<b>PRINT Name of SAMPLER:</b>					
	<b>SIGNATURE of SAMPLER:</b>					
		<b>DATE Signed</b> (MM/DD/YY):				

**\*Important Note:** By signing this form you are accepting Pace's **NET 30** day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Well ID: 1C-W-1  
Sample ID: 1C-W-1-0211  
Well Condition: Cased

Initial Depth to Water\* (ft): 13.32  
 Depth to Product\* (ft): —  
 Product Thickness (ft): —  
 Water Column (ft): —  
 Inner Casing Diameter (Inch): 2  
 Water Volume in Well (gal): —  
 Inner Casing Material: pvc  
 Start Purge Time: 1110

Purge/Sample Method:	low-flow
Purge/Sample Equipment	Peristaltic Pump
Screened Interval Depth Range* (ft)	
Tubing Inlet Depth* (ft):	
Total Well Depth* (feet):	14.50
sampling tube material	polyethylene, silicone

[illegible]

Sample ID	sample time	Analysis	Method	Container	No. of bottles	Preservative
1C-W-1-0211	1140	NWTPH-Dx w/o SGCU		1L Gl. Amber	2	HCL
1C-W-100-0211	1040	NWTPH-Dx		1L GL Amber	2	HCL

Dissolved Oxygen: +/- 10%  
Conductivity: +/- 10%  
Temperature: +/- 10 %  
pH: +/- 0.1 unit  
Redox Potential: +/- 10%  
Turbidity: +/- 10%

collected duplicate LC-W-100-0211 @ 1040

Field parameter meter calibration results are recorded in the field book.

2" casing: 1 ft = 0.164 gal = 0.62 L  
4" casing: 1 ft = 0.656 gal = 2.48 L  
1 gal = 3785.4 mL

Well ID: 1C-W-7  
Sample ID: 1C-W-7-00211  
Well Condition: Good

Purge/Sample Method:	low-flow
Purge/Sample Equipment	Peristaltic Pump
Screened Interval Depth Range* (ft)	
Tubing Inlet Depth* (ft):	12.10
Total Well Depth* (feet):	
sampling tube material	polyethylene, silicone

[illegible]

Sample ID	sample time	Analysis	Method	Container	No. of bottles	Preservative
1CW-7-0211	0950	NWTPH-Dx w/o SGCU		1L Gl. Amber	2	HCL

Small amount of bio black in tubing while purging, cleared after a couple of minutes.

$$1 \text{ gal} = 3785.4 \text{ mL}$$

Well ID: 1C-W-8  
Sample ID: 1C-W-8-0211  
Well Condition: Good.

Purge/Sample Method:	low-flow
Purge/Sample Equipment	Peristaltic Pump
Screened Interval Depth Range* (ft)	
Tubing Inlet Depth* (ft):	13.50
Total Well Depth* (feet):	
sampling tube material	polyethylene, silicone

[illegible]

Sample ID	sample time	Analysis	Method	Container	No. of bottles	Preservative
1C-W-8-0211	1050	NWTPH-Dx w/o SGCU		1L Gl. Amber	2	HCL

1 gal = 3785,4 mL



## Field Activity Log

Page: 1 of

Project Name: SKYKOMISH-BNSF

Completed By: F. MERRILL

Project Number:

Date: 2/21/16

Field Activity: AIR SPARGE WELL SAMPLING

Weather: PARTLY CLOUDY ~ 32°F

Personnel on site: F. MERRILL

~~1C-W-7~~ 1C-W-7

BEGIN PURGING @ 0917 DTW: 11.08

TIME	DTW	FLOW RATE	TEMP (°C)	COND	DO	pH 6.42	ORP	TURB
0941	11.08	200	6.60	0.099	1.97	6.37	147.0	0.95
0944	11.08	200	6.63	0.098	1.89	6.30	142.9	0.80
0947	11.08	200	6.61	0.098	1.81	6.27	138.9	1.42
SAMPLE ID	1C-W-7-041							
TIME	0950							
BOTTLE#	2 (14 AMBER)							
PRESERV.	HCL							

NOTES: NOTICE SMALL AMOUNT OF BIOFLOCC IN TUBING WHILE  
PURGING. CLEARS UP AFTER A COUPLE MINUTES

1000 FINISH SAMPLING 1C-W-7 MOVE TO 1C-W-8

1022 BEGIN PURGING 1C-W-8

1 DTW: 12.58

TIME	DTW	F.R.	TEMP	COND	DO	pH	ORP	TURB
1042	12.58	200	6.34	0.048	1.53	5.46	120.0	0.78
1045	12.58	200	6.16	0.048	1.54	5.43	124.2	0.80
1048	12.58	200	6.17	0.048	1.54	5.38	127.2	0.82
SAMPLE ID	1C-W-8-041							
TIME	1050							
BOTTLE#	2 (14 AMBER)							
PRES.	HCL							

1110 BEGIN PURGING 1C-W-1

DTW: 13.32



TIME	DTW	FR	TEMP	COND	DO	ORP	TURB	<u>PH</u>
<del>1129</del> 1130	13.31	200	6.22	0.077	6.77	349.2	0.53	<del>5.34</del> 5.33
1133	13.31	200	6.32	0.077	6.67	362.8	0.63	5.34
1136	13.31	200	6.31	0.078	6.63	369.4	0.52	5.34

SAMPLE ID : 1C-W-1-0211 TIME: 1140  
 DUP ID : 1C-W-100-0211 TIME: 1040

**CHAIN-OF-CUSTODY / Analytical Request Document**  
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:		Page: <u>1</u> of <u>3</u>	
Company:	BNSF	Report To:	Sarah Albano	Attention:	Bruce Shepard	REGULATORY AGENCY	
Address:		Copy To:	Renee Knecht	Company Name:	BNSF	1468035	
Email To:		Purchase Order No.:	TD100-539	Address:		<input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER	
Phone:		Project Name:	BNSF-Skykomish	Pace Quote Reference:		<input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER	
Requested Due Date/TAI:	5-1	Project Number:	60191113	Pace Project Manager:		Site Location STATE: <u>WA</u>	

Section D Required Client Information										Matrix Codes MATRIX / CODE				Requested Analysis Filtered (Y/N)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
SAMPLE ID (A-Z, 0-9 / -)  Sample IDs MUST BE UNIQUE										Matrix Code (see valid codes to left)				COLLECTED		Preservatives								Analysis Test										Residual Chlorine (Y/N)										Pace Project No./ Lab I.D.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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ITEM #	DATE	TIME	DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other	Y	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								

ADDITIONAL COMMENTS		RELINQUISHED BY / AFFILIATION		DATE		TIME		ACCEPTED BY / AFFILIATION		DATE		TIME		SAMPLE CONDITIONS	
W/SCU - without silica gel cleanup		Mindy Gadda Ascom		3/23/11		0800		Mindy Gadda Ascom		03/23/11		0800			
W/SCU - with silica gel cleanup															
S-W-19-0311: extra sample for MS/MSDS															
SAMPLER NAME AND SIGNATURE		PRINT Name of SAMPLER:		DATE Signed (MM/DD/YY):		Temp in °C		Received on Ice (Y/N)		Custody Sealed Cooler (Y/N)		Samples Intact (Y/N)			
Mindy Gadda Ascom		Mindy Gadda Ascom		03/23/11											



**CHAIN-OF-CUSTODY / Analytical Request Document**  
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

**Section A**

Required Client Information:

Company:

Address:

City:

Email To:

Phone:

Fax:

Requested Due Date/TAT:

**Section B**

Required Project Information:

Report To:

Copy To:

Purchase Order No.:

Project Name:

Project Number:

**Section C**

Invoice Information:

Attention:

Company Name:

Address:

Pace Quote

Reference:

Pace Project Manager:

Pace Profile #:

Page:

2 of 3

1468037

REGULATORY AGENCY

NPDES ☒ GROUND WATER ☐ DRINKING WATER

UST ☐ RCRA ☐ OTHER ☐

Site Location STATE: WA

Requested Analysis Filtered (Y/N)

Residual Chlorine (Y/N)

Pace Project No./ Lab I.D.

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analysis Test	Requested Analysis Filtered (Y/N)	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
			COMPOSITE START	COMPOSITE END/GRAB			H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other						
1	S-W-15 - 0311																		
2	S-W-16 - 1																		
3	S-W-3 - 1																		
4	S-W-1 - 1																		
5	S-W-8 - 1																		
6	S-W-17 - 1																		
7	S-W-170 - 1																		
8	S-W-30 - 1																		
9	S-W-54 - 1																		
10	S-W-1 - 1																		
11	S-W-540 - 1																		
12	S-W-4 - 1																		
ADDITIONAL COMMENTS																			
RELINQUISHED BY / AFFILIATION																			
DATE																			
TIME																			
ACCEPTED BY / AFFILIATION																			
DATE																			
TIME																			
SAMPLER NAME AND SIGNATURE																			
PRINT Name of SAMPLER:																			
SIGNATURE of SAMPLER:																			
DATE Signed (MM/DD/YY):																			

CHAIN-OF-CUSTODY / Analytical Request Document  
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Page: 3 of 3

1468036

Section B  
Required Project Information:

Report To:

Copy To: Sarah Albano  
Renee Knack

Attention:

Company Name: Bruce Sheppard  
BNSF

REGULATORY AGENCY

NPDES ☒ GROUND WATER ☐ DRINKING WATER  
UST ☐ RCRA ☐ OTHER ☐

Purchase Order No.:

Address:

Site Location

Project Name: BNSF-Skykomish  
Requested Due Date/TAT: 5/21/11  
60191113

Pace Quote  
Reference:  
Pace Project Manager:  
Pace Profile #:

STATE: WA

Section A  
Required Client Information:

Company:

Address: BNSF

Report To:

Copy To:

Attention:

Company Name:

REGULATORY AGENCY

NPDES ☒ GROUND WATER ☐ DRINKING WATER  
UST ☐ RCRA ☐ OTHER ☐

Email To:

Phone: Fax:

Requested Due Date/TAT:

Project Number:

Pace Quote  
Reference:  
Pace Project Manager:  
Pace Profile #:

STATE: WA

Section C  
Invoice Information:

Report To:

Copy To:

Attention:

Company Name:

REGULATORY AGENCY

NPDES ☒ GROUND WATER ☐ DRINKING WATER  
UST ☐ RCRA ☐ OTHER ☐

Purchase Order No.:

Address:

Site Location

Project Name: BNSF-Skykomish  
Requested Due Date/TAT: 5/21/11  
60191113

Pace Quote  
Reference:  
Pace Project Manager:  
Pace Profile #:

STATE: WA

Section D  
Required Client Information

Matrix Codes  
MATRIX / CODE

Drinking Water DW  
Water WT  
Waste Water WW  
Product P  
Soil/Solid SL  
Oil OL  
Wipe WP  
Air AR  
Tissue TS  
Other OT

SAMPLE ID  
(A-Z, 0-9 /, -)  
Sample IDs MUST BE UNIQUE

MATRIX CODE (see valid codes to left)

SAMPLE TYPE (G=GRAB C=COMP)

COLLECTED

COMPOSITE  
START

COMPOSITE  
END/GRAB

DATE TIME DATE TIME

SAMPLE TEMP AT COLLECTION

# OF CONTAINERS

Unpreserved  
H<sub>2</sub>SO<sub>4</sub>  
HNO<sub>3</sub>  
HCl  
NaOH  
Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>  
Methanol  
Other

Analysis Test ↓

NWTPH-Dx (W/D SGL)

Residual Chlorine (Y/N)

Pace Project No./ Lab I.D.

ADDITIONAL COMMENTS

RELINQUISHED BY / AFFILIATION

DATE

TIME

ACCEPTED BY / AFFILIATION

DATE

TIME

SAMPLE CONDITIONS

SAMPLER NAME AND SIGNATURE  
PRINT Name of SAMPLER: Mandy Gaddan  
SIGNATURE of SAMPLER: Mandy Gaddan

DATE Signed  
(MM/DD/YY): 03/23/11

Temp in °C  
Received on Ice (Y/N)  
Custody Sealed Cooler (Y/N)  
Samples Intact (Y/N)



# CHAIN-OF-CUSTODY / Analytical Request Document

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<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:		<b>Page:</b> 1 of 2	
Company:	BNSF	Report To:	Sarah Albano	Attention:	Brucel Shoppard	1468039	
Address:		Copy To:	Renee Knecht	Company Name:	BNSF	REGULATORY AGENCY	
Email To:		Purchase Order No.:	TT0100-J39	Address:		NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER	
Phone:		Project Name:	BNSF-SKylomish	Page Quote Reference:		UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER <input type="checkbox"/>	
Requested Due Date/TAT:	5th	Project Number:	60191113	Page Project Manager:		Site Location STATE: <u>MTA</u>	

Section D Required Client Information		Matrix Codes MATRIX / CODE		COLLECTED		PRESERVATIVES		ANALYSIS TEST		Residual Chlorine (Y/N)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE		Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Tissue Other		DW WT WW P SL OL WP AR TS OT	COMPOSITE START	COMPOSITE END/GRAB	Unpreserved	↓ Analysis Test ↓	Y	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
		MATRIX CODE (see valid codes to left)		SAMPLE TYPE (G=GRAB C=COMP)			H <sub>2</sub> SO <sub>4</sub>					HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
ITEM #	DATE	TIME	DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
1	MW-1G-0311		3/21/11	1615	6	2	X																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

SAMPLER NAME AND SIGNATURE		DATE		TIME		ACCEPTED BY / AFFILIATION		DATE		TIME		SAMPLE CONDITIONS	
PRINT Name of SAMPLER:		3/23/11		1625		Pace Warehouse / PACE		032311		1625			
SIGNATURE of SAMPLER:													
DATE Signed (MM/DD/YY):													
Temp in °C													
Received on Ice (Y/N)													
Custody Sealed Cooler (Y/N)													
Samples Intact (Y/N)													



The Chain-of-Custody is a **LEGAL DOCUMENT**. All relevant fields must be completed accurately.

2 of 2

1468033

**Pace Project No./ Lab I.D.**

## CHAIN-OF-CUSTODY / Analytical Request Document

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Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	BNSF	Report To:	Sarah Albano	Attention:	Bruce Sheppard
Address:		Copy To:	Renee Knecht	Company Name:	BNSF
				Address:	
Email To:		Purchase Order No.:	TT0100-J39	Pace Quote Reference:	
Phone:		Project Name:	BNSF-Skykamish	Pace Project Manager:	
Requested Due Date/TAT:	std	Project Number:	60191113	Pace Profile #:	
			REGULATORY AGENCY		
			<input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER		
			<input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER		
			Site Location		WA
			STATE:		

[illegible]

W/6364 - with the 1st silica gel cleanup	W/5064 - with silica gel cleanup	W/5064 - with silica gel cleanup	Mindy Gadden AESon	3/23/11	0800	Bottle/Label	PACIE	082311	0800	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
5-W-19-0311: extra sample for MS/MSD's													
SAMPLER NAME AND SIGNATURE <i>Mindy Gadden</i>													
PRINT Name of SAMPLER: <i>Mindy Gadden</i>													
SIGNATURE of SAMPLER: <i>Mindy Gadden</i>													
DATE Signed (MM/DD/YY): <i>03/23/11</i>													









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## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	BNSF	Report To:	Sarah Albano	Attention:	Bruce Sheppard
Address:		Copy To:	Renee Knecht	Company Name:	BNSF
				Address:	
Email To:		Purchase Order No.:	TT0100-139	Face Quote Reference:	
Phone:		Project Name:	BNSF-Skykomish	Face Project Manager:	
Requested Due Date/TAT:	std	Project Number:	60191113	Face Profile #:	
			REGULATORY AGENCY		
			<input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER		
			Site Location		STATE: WA

[illegible][illegible]

E-ALL-Q-020rev 07 15-May-2007



The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	BNSF	Report To:	Seah Aikawa	Attention:	Bruce Sheppard
Address:		Copy To:	Reece Knecht	Company Name:	BNSF
				Address:	
Email To:		Purchase Order No.:	TT0100-139	Pace Quote Reference:	
Phone:		Project Name:	BNSF-Skykams	Pace Project Manager:	
		Project Number:	6019113	Pace Profile #:	
Requested Due Date/TAT:					

Page: <u>2</u>	of <u>2</u>	
1468033		
REGULATORY AGENCY		
<input type="checkbox"/> NPDES	<input checked="" type="checkbox"/> GROUND WATER	<input type="checkbox"/> DRINKING WATER
<input type="checkbox"/> UST	<input type="checkbox"/> RCRA	<input type="checkbox"/> OTHER
Site Location	<u>WA</u>	
STATE:		

[illegible]

3	SAMPLER NAME AND SIGNATURE		Temp In °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	PRINT Name of SAMPLER:					
	SIGNATURE of SAMPLER:					
	DATE Signed (MM/DD/YY):					

F-ALL-Q-020rev.07. 15-May-2007







## GROUNDWATER SAMPLING LOG

Project name      BNSF-Skykomish

Project No.	60154595-0540
-------------	---------------

Date 3/23/11

Well No. MW-4

Sampled By DWK

weather Clear, 35°F

WELL INFORMATION	
------------------	--

Depth to water 8.24 (ft)

Depth of well: \_\_\_\_\_ (ft)

Well diameter: 7 (in)

Feet of water: \_\_\_\_\_ (ft)

Product thickness: None (ft)

Screen interval: \_\_\_\_\_

well condition: o/c

COMMENTS	
----------	--

Tubing Inlet at  $\approx 9.0$  /

PURGE DATA	
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
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89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

start purge time	1012	
------------------	------	--

time		1022	1025	1028	1031			
------	--	------	------	------	------	--	--	--

DTW	(ft)	8.78							
-----	------	------	--	--	--	--	--	--	--

purge rate	(L/min)	0.30	→						
------------	---------	------	---	--	--	--	--	--	--

pH	(Units)	5.42	5.42	5.45	5.45		
----	---------	------	------	------	------	--	--

conductivity	(umhos/cm)	0,11	0,109	0,105	0,104			
--------------	------------	------	-------	-------	-------	--	--	--

Temperature	(deg C)	3.8	3.8	3.8	3.8			
-------------	---------	-----	-----	-----	-----	--	--	--

D.O.	(mg/L)	3.42	3.27	3.16	3.09			
------	--------	------	------	------	------	--	--	--

ORP	(mv)	325	317	310	302			
-----	------	-----	-----	-----	-----	--	--	--

turbidity	(NTU)	1.75	1.01	0.95	0.99			
-----------	-------	------	------	------	------	--	--	--

Source and sample equip.	Peristaltic pump and silicone/polyethylene tubing
--------------------------	---

SAMPLE INFORMATION	
--------------------	--

sample number	time	analysis	container	# bottles	preservative
---------------	------	----------	-----------	-----------	--------------

mw-4-0311	1035	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HGI
-----------	------	-------------------	--------------	---	-----

	NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl
--	---------------------	--------------	---	-----

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# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. MW-16

Sampled By DW/K

weather cloudy, 45 °F

## WELL INFORMATION

Depth to water 12.96 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: None (ft)  
 Screen interval:  
 well condition: ok

## COMMENTS

Duplicate sample collected  
 MW-160-0311

Tubing inlet at ~13.75'

## PURGE DATA

start purge time	1555						
time		1605	1608	1611			
DTW	(ft)	12.96					
purge rate	(L/min)	0.30					
pH	(Units)	4.58	4.57	4.57			
conductivity	(umhos/cm)	0.040	0.048	0.040			
temperature	(deg C)	5.7	5.7	5.7			
D.O.	(mg/L)	10.85	10.56	10.85			
ORP	(mv)	440	442	444			
turbidity	(NTU)	0.50	0.45	0.44			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
MW-16-0311	1615	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl
MW-160-0311	1630	"	"	"	"
(duplicate)					

# GROUNDWATER SAMPLING LOG

Date 3/11/11

weather Rainy, 40 °F

WELL INFORMATION		
Depth to water	4.46	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	None	(ft)
Screen interval:		
well condition:	OK	

[illegible]

		PURGE DATA					
start purge time	1455						
time		1505	1508	1511	1514		
DTW	(ft)	4.50	4.50	4.49	4.49		
purge rate	(L/min)	0.30					
pH	(Units)	5.23	5.25	5.22	5.21		
conductivity	(umhos/cm)	0.066	0.068	0.066	0.06		
temperature	(deg C)	7.5	7.5	7.5	7.5		
D.O.	(mg/L)	1.32	1.27	1.23	1.20		
ORP	(mv)	94	93	94	95		
turbidity	(NTU)	1.51	0.85	0.88	0.83		
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

[illegible]



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 3/22/11

Well No. 5-W-14  
Sampled By M61  
weather Partly Cloudy 46 °F

WELL INFORMATION	
Depth to water	9.19 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	— (ft)
Screen interval:	
well condition:	OK

COMMENTS
No order

PURGE DATA							
start purge time	0857						
time		0907	0910	0913			
DTW	(ft)	9.19	9.19	9.19			
purge rate	(L/min)	.275	.275	.275			
pH	(Units)	6.06	6.08	6.11			
conductivity	(umhos/cm)	0.054	0.054	0.053			
temperature	(deg C)	7.14	7.11	7.12			
D.O.	(mg/L)	4.52	4.49	4.42			
ORP	(mv)	60.1	59.7	52.7			
turbidity	(NTU)	0.10	0.46	0.08			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
5-W-14-0311	0915	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
11	0915	NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 5-W-15

Sampled By MGA

weather Partly cloudy 48 °F

## WELL INFORMATION

Depth to water 7.69 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: — (ft)  
 Screen interval:  
 well condition: OK

## COMMENTS

Purge started as orange color  
 HC color

1105 - orange rust color began purging -  
 wait to see if it will stay clear

## PURGE DATA

start purge time	1050						
time		1105	1110	1113	1116	1119	
DTW	(ft)	<del>8.8</del> 7.81	7.81	7.81	7.81	7.81	
purge rate	(L/min)	.3	.3	.3	.3	.3	
pH	(Units)	6.77	6.80	6.82	6.81	6.80	
conductivity	(umhos/cm)	0.199	0.199	0.199	0.200	0.199	
temperature	(deg C)	6.70	6.77	6.78	6.71	6.78	
D.O.	(mg/L)	0.71	0.80	0.73	0.69	0.66	
ORP	(mv)	-44.6	-42.7	-39.3	-42.8	-40.0	
turbidity	(NTU)	117	27.5	11.8	10.1	7.61	
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-15-0311	1120	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
"	1120	NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/32/11

Well No. 5-W-16

Sampled By MG

weather Partly cloudy 44 °F

## WELL INFORMATION

Depth to water	8.00	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	-	(ft)
Screen interval:		
well condition:	OK	

## COMMENTS

No odor

## PURGE DATA

start purge time	0957						
time		1007	1010	1013			
DTW	(ft)	8.00	8.00	8.00			
purge rate	(L/min)	.3	.3	.3			
pH	(Units)	6.26	6.34	6.40			
conductivity	(umhos/cm)	6.067	6.071	6.073			
temperature	(deg C)	6.49	6.46	6.48			
D.O.	(mg/L)	3.38	3.22	3.20			
ORP	(mv)	34.6	33.8	33.9			
turbidity	(NTU)	1.29	0.98	0.75			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-16-0311	1015	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
	1015	NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 5-W-17

Sampled By MG

weather Cloudy, 45°F

## WELL INFORMATION

Depth to water 7.35 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: — (ft)  
 Screen interval:  
 well condition: OK

## COMMENTS

Duplicate sample collected  
 5-W-170-0311

## PURGE DATA

start purge time	1245							
time		1255	1258	1301				
DTW	(ft)	7.36	7.36	7.36				
purge rate	(L/min)	.3	.3	.3				
pH	(Units)	6.34	6.23	6.25				
conductivity	(umhos/cm)	0.057	0.055	0.053				
temperature	(deg C)	7.25	7.26	7.21				
D.O.	(mg/L)	3.03	3.05	3.09				
ORP	(mv)	32.2	37.9	39.5				
turbidity	(NTU)	0.66	0.77	0.72				
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-17-0311	1305	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
	1305	NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl
5-W-17-0311	1205	11	11	11	11
(duplicate)	1205	11	11	11	11
5-W-170-0311					

dup  
label



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 5-W-18

Sampled By DWL

weather Partly cloudy, 40 °F

## WELL INFORMATION

Depth to water 7.57 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: None (ft)  
 Screen interval:  
 well condition: OK

## COMMENTS

Tubing inlet at ~ 8.75'

## PURGE DATA

start purge time	0848						
time		0858	0901	0904	0907		
DTW	(ft)	7.51					
purge rate	(L/min)	0.30					
pH	(Units)	6.34	6.36	6.37	6.40		
conductivity	(umhos/cm)	0.179	0.179	0.179	0.179		
temperature	(deg C)	5.3	5.3	5.3	5.3		
D.O.	(mg/L)	1.15	1.10	1.08	1.06		
ORP	(mv)	273	268	264	260		
turbidity	(NTU)	6.41	5.49	5.57	5.26		
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-18-0311	09:11	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 5-W-19

Sampled By UNK

weather cloudy, 40°F

## WELL INFORMATION

Depth to water 7.40 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: None (ft)  
 Screen interval:  
 well condition: ok

## COMMENTS

Extra sample volume for lab RC

Tubing inlet at ~8.25'

## PURGE DATA

start purge time	0929						
time	0939	0942	0945				
DTW	(ft) 7.40						
purge rate	(L/min) 0.30						
pH	(Units) 5.86	5.83	5.81				
conductivity	(umhos/cm) 0.069	0.069	0.071				
temperature	(deg C) 6.6	6.6	6.6				
D.O.	(mg/L) 8.67	8.66	8.66				
ORP	(mv) 397	404	406				
turbidity	(NTU) 0.20	0.18	0.15				
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-19-0311	0950	NWTPH-Dx (w/SGCU)	1L Gl. Amber	5	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	5	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 3/22/11

Well No. 5-W-20  
Sampled By pmk  
weather cloudy 45°F

WELL INFORMATION	
Depth to water	6.92 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	None (ft)
Screen interval:	
well condition:	ok

COMMENTS
Tubing inlet at ~7.5'

PURGE DATA							
start purge time	1036						
time		1046	1049	1052			
DTW	(ft)	6.92					
purge rate	(L/min)	0.32					
pH	(Units)	6.46	6.47	6.47			
conductivity	(umhos/cm)	0.47	0.46	0.46			
temperature	(deg C)	5.9	5.9	5.9			
D.O.	(mg/L)	1.40	1.41	1.33			
ORP	(mv)	229	226	225			
turbidity	(NTU)	0.91	0.86	0.85			
purge and sample equip.		Peristaltic pump and silicone/polyethylene tubing					

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
5-W-20-0311	1055	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl







# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. SW-50

Sampled By DNL

weather cloudy, 45 °F

## WELL INFORMATION

Depth to water 6.97 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: None (ft)  
 Screen interval:  
 well condition: ok

## COMMENTS

Tubing inlet at ~ 7.75'

## PURGE DATA

start purge time	1253						
time	1303	1306	1309				
DTW	(ft) 6.98						
purge rate	(L/min) 0.30						
pH	(Units) 6.55	6.54	6.55				
conductivity	(umhos/cm) 0.192	0.19	0.19				
temperature	(deg C) 5.8	5.8	5.8				
D.O.	(mg/L) 1.32	1.29	1.26				
ORP	(mv) 188	185	181				
turbidity	(NTU) 0.85	0.82	0.80				
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-50-0311	1315	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 5-W-51

Sampled By DWK

weather P. Cloudy, 45°F

## WELL INFORMATION

Depth to water	6.97	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	Trace	(ft)
Screen interval:		
well condition:	OK	

## COMMENTS

Tubing inlet at ~7.5'

## PURGE DATA

start purge time	1639								
time									
DTW	(ft)	No parameters - product in discharge line							
purge rate	(L/min)								
pH	(Units)								
conductivity	(umhos/cm)								
temperature	(deg C)								
D.O.	(mg/L)								
ORP	(mv)								
turbidity	(NTU)								
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing								

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-51-0311	1655	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 3/22/11

Well No. 5-W-54  
Sampled By MG  
weather partly cloudy 50°F

WELL INFORMATION	
Depth to water	6.65 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	— (ft)
Screen interval:	
well condition:	OK

COMMENTS
Duplicate sample collected: 5-W-540-0311

PURGE DATA								
start purge time	1351							
time		1401	1404	1407	1410	1413	1415	1418
DTW	(ft)	6.65	6.65	6.65	6.65	6.65	6.65	6.65
purge rate	(L/min)	.3	.3	.3	.3	.3	.3	.3
pH	(Units)	6.26	6.29	6.31	6.26	6.32	6.33	6.36
conductivity	(umhos/cm)	0.077	0.087	0.091	0.093	0.095	0.096	0.098
temperature	(deg C)	6.69	6.74	6.76	6.88	7.07	7.25	7.52
D.O.	(mg/L)	4.20	3.34	3.11	2.85	2.48	2.28	1.79
ORP	(mv)	36.6	34.0	34.3	30.0	25.8	23.8	19.4
turbidity	(NTU)	0.72	0.98	0.59	0.41	0.22	0.11	0.15
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
5-W-54-0311	1435	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl
5-W-540-0311	1400	//	//	//	//
(duplicate)	1400	—	—		





# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/23/11

Well No. 5-W-55

Sampled By F.M.

weather CLEAR 43 °F

## WELL INFORMATION

Depth to water 6.38 (ft)  
 Depth of well: (ft)  
 Well diameter: (in)  
 Feet of water: (ft)  
 Product thickness: (ft)  
 Screen interval:  
 well condition:

## COMMENTS

## PURGE DATA

start purge time	0733							
time		0743	0746	0749	0752	0756	0759	1000
DTW	(ft)	6.40	6.40	6.41	6.41	6.41	6.41	6.41
purge rate	(L/min)	110	110	110	110	110	110	110
pH	(Units)	6.03	6.00	5.96	5.96	5.95	5.93	5.96
conductivity	(umhos/cm)	79	87	85	81	77	74	74
temperature	(deg C)	5.56	5.53	5.52	5.44	5.44	5.44	5.44
D.O.	(mg/L)	3.41	3.45	3.63	4.12	4.45	4.23	4.41
ORP	(mv)	76.7	74.5	72.8	100.6	110.8	117.9	121.6
turbidity	(NTU)	1.03	0.44	0.49	0.20	0.11	0.00	0.00
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-55-0311	1005	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Page 1

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 3/23/11

Well No. S-W-56  
Sampled By F. MERRILL  
weather CLEAR 43 °F

WELL INFORMATION	
Depth to water	7.15 (ft)
Depth of well:	(ft)
Well diameter:	(in)
Feet of water:	(ft)
Product thickness:	(ft)
Screen interval:	
well condition:	

COMMENTS

PURGE DATA								
start purge time	0816							
time		0829	0832	0835	0838	0841	0844	0849
DTW	(ft)	7.18	7.19	7.20	7.21	7.23	7.26	7.25
purge rate	(L/min)	250	250	250	267	270	270	271
pH	(Units)	6.01	6.01	5.99	6.02	6.03	6.03	6.04
conductivity	(umhos/cm)	243	255	262	267	269	270	272
temperature	(deg C)	3.30	3.20	3.19	3.21	3.21	3.25	3.44
D.O.	(mg/L)	2.94	2.74	2.27	2.15	1.95	1.65	1.26
ORP	(mv)	163.0	144.1	134.2	124.1	118.4	112.4	96.4
turbidity	(NTU)	16.44	9.23	9.35	3.90	1.31	0.60	0.45
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

250ml/min

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
S-W-56-0311	1910	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

pg 2

Well No. 5-w 56

Sampled By F. M. Brown

weather CLEAR 43 °F

## COMMENTS

DO. WAS NOT USED IN

### STABILIZATION PARAMETERS

DO. FLUCTUATED BETWEEN

1.00 + 1.29 consistently

THROUGHOUT PURBING DURATION

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## PURGE DATA

start purge time	811.
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time		0853	0856	0859	0902	0905		
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DTW	(ft)	7.24	7.24	7.24	7.24	7.24		
-----	------	------	------	------	------	------	--	--

purge rate	(L/min)	250	250	250	250	250		
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pH	(Units)	6.06	6.06	6.06	6.06	6.06		
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conductivity	(umhos/cm)	273	271	271	270	270		
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temperature	(deg C)	3.38	3.34	3.40	3.31	3.31		
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D.O.	(mg/L)	1.43	1.20	1.03	1.80	1.35		
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ORP	(mv)	83.4	83.3	76.4	72.9	70.1		
-----	------	------	------	------	------	------	--	--

turbidity	(NTU)	7.09	6.74	6.59	6.54	7.17		
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purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing
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## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
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S.W. 56-0311	0910	NWTPH-Dx	1L Gl. Amber	2	HCl
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# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/23/11

Well No. 1A-W-4

Sampled By F. Merriam

weather CLEAR SC °F  
sunny

## WELL INFORMATION

Depth to water 9.08 (ft)  
Depth of well: (ft)  
Well diameter: (in)  
Feet of water: (ft)  
Product thickness: (ft)  
Screen interval:  
well condition:

## COMMENTS

TURN @ 10.08

## PURGE DATA

start purge time	1257							
time		1307	1310	1313	1316	1319		
DTW	(ft) 9.18	10.18	10.18	10.18	10.18	9.18		
purge rate	(L/min)	200	200	200	200	200		
pH	(Units)	6.37	6.37	6.38	6.35	6.36		
conductivity	(umhos/cm)	78	74	63	66	65		
temperature	(deg C)	7.07	7.08	7.20	7.12	7.20		
D.O.	(mg/L)	6.53	6.31	6.18	6.08	6.01		
ORP	(mv)	254.2	254.0	254.0	254.1	254.3		
turbidity	(NTU)	21.7	5.92	3.28	2.12	1.00		
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
1A-W-4-0311	1320	MWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 1B-W-3

Sampled By F.M.

weather OVERCAST ~ 53 °F

## WELL INFORMATION

Depth to water 14.66 (ft)  
 Depth of well: (ft)  
 Well diameter: (in)  
 Feet of water: (ft)  
 Product thickness: (ft)  
 Screen interval:  
 well condition:

## COMMENTS

## PURGE DATA

start purge time	1500							
time		1513	1516	1519	1522	1525		
DTW	(ft)	14.67	14.67	14.67	14.69	14.69		
purge rate	(L/min)	220	220	220	220	220		
pH	(Units)	6.55	6.43	6.38	6.32	6.39		
conductivity	(umhos/cm)	98	94	93	93	93		
temperature	(deg C)	6.76	6.48	6.48	6.67	6.57		
D.O.	(mg/L)	3.64	4.35	5.00	4.90	4.62		
ORP	(mv)	160.0	166.8	176.4	182.1	183.1		
turbidity	(NTU)	3.20	3.26	4.40	2.74	2.34		
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
1B-W-3-0311	1530	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl









# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 1C-W-3

Sampled By F. MERRELL

weather OVERCAST °F

## WELL INFORMATION

Depth to water 10.45 (ft)  
 Depth of well: (ft)  
 Well diameter: 2" (in)  
 Feet of water: (ft)  
 Product thickness: (ft)  
 Screen interval:  
 well condition:

## COMMENTS

11.45 - TUBING DEPTH

## PURGE DATA

start purge time	1046							
time		1105	1108	1111	1114	1117	1120	1123
DTW	(ft)	10.80	10.80	10.81	10.82	10.82	10.82	10.82
purge rate	(L/min)	100	100	100	100	100	100	100
pH	(Units)	5.90	5.96	6.05	6.00	5.96	5.96	5.96
conductivity	(umhos/cm)	49	50	50	49	50	50	50
temperature	(deg C)	5.26	5.29	5.32	5.22	5.29	5.24	5.36
D.O.	(mg/L)	8.02	7.88	7.71	7.73	7.52	7.46	7.25
ORP	(mv)	283.2	286.4	289.5	293.0	295.0	296.0	300.0
turbidity	(NTU)	NM	43.1	49.6	50.6	29.8	31.3	28.6
purge and sample equip.		Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
1C-W-3-0311	1125	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 1C-W-4

Sampled By FV

weather °F

## WELL INFORMATION

Depth to water 10.12 (ft)  
 Depth of well: (ft)  
 Well diameter: (in)  
 Feet of water: (ft)  
 Product thickness: (ft)  
 Screen interval:  
 well condition:

## COMMENTS

TUBING @ 11.12

## PURGE DATA

start purge time	1303							
time		1316	1319	1322	1325			
DTW	(ft)	10.18	10.26	10.21	10.20			
purge rate	(L/min)	225	225	225	225			
pH	(Units)	5.88	5.87	5.87	5.95			
conductivity	(umhos/cm)	57	57	57	57			
temperature	(deg C)	5.56	5.51	5.49	5.51			
D.O.	(mg/L)	2.44	2.36	2.39	2.31			
ORP	(mv)	294.6	290.1	283.3	280.5			
turbidity	(NTU)	7.36	2.76	0.92	0.64			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
1C-W-4-0311	1330	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl











# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 3/23/11

Well No. 2A-W-40  
Sampled By F. Merrill  
weather CLEAR/sunny °F

WELL INFORMATION	
Depth to water	11.98 (ft)
Depth of well:	(ft)
Well diameter:	(in)
Feet of water:	(ft)
Product thickness:	(ft)
Screen interval:	
well condition:	

COMMENTS
Duplicate sample collected 2A-W-400-0311

PURGE DATA							
start purge time	1340						
time		1350	1353	1356			
DTW	(ft)	11.99	11.98	11.98			
purge rate	(L/min)	250	250	250			
pH	(Units)	6.31	6.34	6.36			
conductivity	(umhos/cm)	44	43	42			
temperature	(deg C)	6.57	6.67	6.76			
D.O.	(mg/L)	5.92	5.94	5.93			
ORP	(mv)	238.5	237.1	235.1			
turbidity	(NTU)	1.10	0.00	0.75			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
2A-W-40-031	1400	NWTPH-Dx	1L Gl. Amber	2	HCl
2A-W-400-0311 (duplicate)	1300	"	"	"	"





# GROUNDWATER SAMPLING LOG

Project No. 60154595-0540

Well No.

weather °F

WELL INFORMATION	
Depth to water	12.01 (ft)
Depth of well:	(ft)
Well diameter:	(in)
Feet of water:	(ft)
Product thickness:	(ft)
Screen interval:	
well condition:	

[illegible]

PURGE DATA								
start purge time	1605							
time		1626	1629	1632				
DTW	(ft)	12.01	12.01	12.01				
purge rate	(L/min)	250	250	250				
pH	(Units)	5.93	5.97	5.93				
conductivity	(umhos/cm)	542.94	94	94				
temperature	(deg C)	6.88	7.02	7.13				
D.O.	(mg/L)	1.41	1.44	1.46				
ORP	(mv)	193.2	191.6	192.1				
turbidity	(NTU)	2.97	4.37	3.01				
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

[illegible]

# GROUNDWATER SAMPLING LOG

Date 3/21/11

weather *cloudy 25° F*

### COMMENTS

Trailing inlet at  $\sim 3.0'$

PURGE DATA	
------------	--

start purge time	0910						
time		0920	0925	0928			
DTW	(ft)	2.26	2.26	2.26			
purge rate	(L/min)	0.30					
pH	(Units)	4.29	4.22	4.19			
conductivity	(umhos/cm)	0.090	0.085	0.088			
temperature	(deg C)	4.4	4.4	4.4			
D.O.	(mg/L)	4.91	4.80	4.77			
ORP	(mv)	316	313	311			
turbidity	(NTU)	0.85	0.90	0.87			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION	
--------------------	--

sample number	time	analysis	container	# bottles	preservative
2A-W-4-0311	0930	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl









# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/21/11

Well No. GW-3

Sampled By DWK

weather Rainy, 40 °F

## WELL INFORMATION

Depth to water 16.38 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: None (ft)  
 Screen interval:  
 well condition: OK

## COMMENTS

Duplicate sample  
 collected: GW-30-0311  
 Tabling Inlet at ~17.0'

## PURGE DATA

start purge time	1616				
time		1626	1639	1652	1655
DTW	(ft)	16.39			
purge rate	(L/min)	0.30			
pH	(Units)	5.37	5.34	5.34	5.36
conductivity	(umhos/cm)	0.046	0.042	0.044	0.047
temperature	(deg C)	7.3	7.4	7.4	7.4
D.O.	(mg/L)	7.95	7.95	7.96	7.97
ORP	(mv)	422	431	435	437
turbidity	(NTU)	2.01	0.60	0.55	0.54
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing				

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
GW-3-0311	1640	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl
GW-30-0311	1655	"	"	"	"

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/23/11

Well No. GW-A

Sampled By DUK

weather clear, 30 °F

## WELL INFORMATION

Depth to water 9.52 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: none (ft)  
 Screen interval:  
 well condition: o/c

## COMMENTS

Tubing inlet at ~10.25'

## PURGE DATA

start purge time	08:23						
time		0833	0836	0839	0842	0845	0848
DTW	(ft)	9.76	9.77	9.77	9.78	9.78	9.79
purge rate	(L/min)	0.30					
pH	(Units)	5.30	5.32	5.33	5.33	5.34	5.34
conductivity	(umhos/cm)	0.145	0.144	0.142	0.141	0.141	0.140
temperature	(deg C)	6.0	6.0	6.0	6.0	6.1	6.1
D.O.	(mg/L)	3.10	3.03	3.01	2.97	2.94	2.93
ORP	(mv)	405	395	379	371	368	365
turbidity	(NTU)	8.55	7.10	3.65	3.00	2.85	2.71
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
GW-4-0311	0850	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

## AECOM ENVIRONMENT

## FIELD ACTIVITY LOG

PROJECT BNSF - Sky KomishCOMPLETED BY D. KinneyJOB NO. 6019113

APPROVED BY \_\_\_\_\_

DAY & DATE Mon. Mar 21<sup>st</sup> 2011SHEET 1 OF 2

## FIELD ACTIVITY SUBJECT:

## DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

GW Gauging &amp; Sampling

TIME	
0815	Arrived onsite & setup to sample
0905	Gauged 2B-W-4, calibrating VSI (model 55) & Lamotte (model 100) meters
0910	Started purging 2B-W-4
0930	Sampled 2B-W-4 for NWTPH-DX
0940	Gauging railroad wells
1000	Met w/ Mindy; safety briefing
1020	Gauging wells
1040	Met w/ Fred; safety briefing
1045	Continued gauging
1125	Helped find 5-W-43
1145	went to lunch
1225	Returned from lunch; Fred & Mindy gauging MW's; I will do vaults
1339	Started purging 5-W-43
1400	Sampled 5-W-43 (same as 2B-W-4)
1422	Started purging GW-1
1440	Sampled GW-1 (same as 2B-W-4)
1455	Started purging MW-38R
1515	Sampled MW-38R (same as 2B-W-4)
1531	Started purging GW-2
1555	Sampled GW-2 (same as 2B-W-4)
1616	Started purging GW-3

## VISITORS ON SITE:

None

## CHANGES FROM PLANS OR IMPORTANT DECISIONS:

None

## WEATHER CONDITIONS:

Raining, 35-45°F

## IMPORTANT TELEPHONE CALLS:

None

## PERSONNEL ON SITE:

Dean Kinney, Fred Merrill &amp; Mindy Gradlon

## FIELD ACTIVITY LOG

COMPLETED BY D. Kinney

APPROVED BY \_\_\_\_\_

SHEET 2 OF 2

**DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:**

## GW Sampling

[illegible]

No 2

None

Cloudy to Rainy, 40-48

Name \_\_\_\_\_

See Pg 1



## AECOM ENVIRONMENT

## FIELD ACTIVITY LOG

PROJECT BNSF-Skykomish COMPLETED BY D. Kinney  
 JOB NO. 6019113 APPROVED BY \_\_\_\_\_  
 DAY & DATE Tues Mar 22<sup>nd</sup> 2011 SHEET 1 OF 2

FIELD ACTIVITY SUBJECT: DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:	
TIME	GW Sampling
0735	Arrived onsite & had safety mtg
0750	Organizing Van
0755	Calibrating meters (VSI-model 556 & Lutron-model 2020) - couldn't get to calibrate until second time.
0842	started purging 5-W-18
0910	Sampled 5-W-18 for NWTPH-DX
0929	Started purging 5-W-19
0950	Sampled 5-W-19 (same as 5-W-18)
1036	Started purging 5-W-20
1055	Sampled 5-W-20 (same as 5-W-18)
1115	Started purging 5-W-42
1135	Sampled 5-W-42 (same as 5-W-18)
1150	Lunch
1235	Returned from lunch & setup on
1253	Started purging 5-W-50
1315	Sampled 5-W-50 (same as 5-W-18)
1325	Went to dump purge water at treatment bldg
1350	Started purging EW-1
1410	Sampled EW-1 for NWTPH-DX
1430	Went to get Mindy loaded for lab
1555	Started purging MW-16, Mindy left site
1615	Sampled MW-16 (same as EW-1); took dupll site 'labeled' MW16-0311
VISITORS ON SITE:	CHANGES FROM PALNS OR IMPORTANT DECISIONS:
None	None
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS:
Raining to Cloudy, 35-45°F	None
PERSONNEL ON SITE: Dean Kinney, Fred Merrill & Mindy Graddon	

## FIELD ACTIVITY LOG

COMPLETED BY A. Kinney  
APPROVED BY \_\_\_\_\_

APPROVED BY \_\_\_\_\_

SHEET 2 OF 2

**DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:**

GW Sampling

<b>VISITORS ON SITE:</b>  None	<b>CHANGES FROM PALNS OR IMPORTANT DECISIONS:</b>  None
<b>WEATHER CONDITIONS:</b>  cloudy , 45-92	<b>IMPORTANT TELEPHONE CALLS:</b>  None
<b>PERSONNEL ON SITE:</b> see pg 1	

## AECOM ENVIRONMENT

## FIELD ACTIVITY LOG

PROJECT BNSF-SkykomishCOMPLETED BY D. KinneyJOB NO. 60191113

APPROVED BY \_\_\_\_\_

DAY & DATE Wed Mar 23<sup>rd</sup> 2011SHEET 1 OF \_\_\_\_\_

## FIELD ACTIVITY SUBJECT:

## DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

GW Sampling

TIME	
0730	Arrived onsite
0735	Safety Mtg
0745	Calibrating meters - K&L (model 550 & LaMotte Model 2020)
0823	started purging GW-4
0850	Sampled GW-4 for NWTPH-DX
0930	started purging MW-3
0950	sampled MW-3 for NWTPH-DX
1012	started purging MW-4
1035	sampled MW-4 for NWTPH-DX
1040	started purging 2A-W-10
1100	sampled 2A-W-10 for NWTPH-DX
1145	started purging 2A-W-9 after grabbing lunch
1205	sampled 2A-W-9 for NWTPH-DX
1215	Pumping purge water into treatment system
1255	checked w/Fred & then went to look at vault piezo's
1305	Took pictures of vault piezo's
1320	Filling vault piezometers
1530	Went to pump rest of purge water
1545	Dropped cooler at bunkhouse
1550	left site

## VISITORS ON SITE:

None

## CHANGES FROM PLANS OR IMPORTANT DECISIONS:

None

## WEATHER CONDITIONS:

Clear, 30-45°F

## IMPORTANT TELEPHONE CALLS:

None

## PERSONNEL ON SITE:

Dean Kinney, Fred Marshall

## Fluid Level Gauging Form

Project Name: BNSF Skykomish		Project Number: 60191113		Collected by: D. Klancy, F. Merrill, M. Gradden		9/20/2010							
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
1A-W-4	03/21/11	1309	NM	8.88	None	None	WL	9.47				FM	
1A-W-5				NM				NM					Well abandoned
1A-W-38				NM				NM					Not installed
1B-W-2		1318		14.54	None	None	WL	13.51				FM	
1B-W-3		1323		14.58				14.91				FM	
1C-W-1		1322		13.02				13.63				MG	
1C-W-2				NM				NM					Well destroyed during sewer work
1C-W-3		1333		10.38	None	None	WL	10.87				FM	
1C-W-4		1335		10.06				10.45				FM	
1C-W-7		1313		10.75				11.52				MG	
1C-W-8		1329		10.31				12.98				MG	
2A-W-5		1035		11.94				13.95				MG	
2A-W-7		1108		11.01				11.81					
2A-W-8		1055		14.13				15.00					
2A-W-9		0948		9.78				11.41					
2A-W-10		0945		9.47				11.54					
2B-W-4		0905		2.25				3.81					
5-W-4				NM				NM					Well abandoned
5-W-14		1010		9.19	None	None	WL	9.19				MG	
5-W-15		1030		7.67				7.75					
5-W-16		1042		8.00				8.02					
5-W-17		1025		7.36				7.35					
5-W-18		1045		7.47				7.52					
5-W-19		1049		7.36				7.44					
5-W-20		1005		6.90				7.00					
5-W-42		1052		6.56				6.75					
5-W-43		1337		6.96				NM					
5-W-44				NM				NM					Not installed
5-W-50		1036		6.86	None	None	WL	7.24				MG	
5-W-52				NM				NM					Well abandoned
5-W-53				NM				NM					Well abandoned
5-W-54		1133		6.48	None	None	WL	6.85				FM	
5-W-55		1125		6.27				6.42					
5-W-56		1129		7.02				6.58					

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010				Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
MW-1	03/21/11	1043	NM	11.85	None	None	WL	13.09				DWK	
MW-2		1101		11.35				12.70					
MW-3		0930		7.80				10.78					
MW-4		0542		7.84				10.12					
MW-5		0950		6.54				8.18					
MW-9		1123		11.25				13.32					
MW-10		1120		11.32				13.10					
MW-11		1116		12.00	12.02	Trace	↓/top	13.73					
MW-12				NM				NM					Well abandoned
MW-12R				NM				NM					Not Installed
MW-13		1021	NM	9.01	None	None	WL	10.31				DWK	
MW-14		1023	NM	10.96				12.28					
MW-15		1029		12.09				13.52					
MW-16		1126		12.81				13.57					
MW-18		1035		13.35				15.10					
MW-32		1258		8.88				9.19				FM	
MW-38R		1120		4.43				4.92				DWK	FM
MW-40		1026		11.59				12.98					
1A-W-36				NM				NM					Not Installed
1A-W-37				NM				NM					Not Installed
1B-W-23		1252		16.29	None	None	WL	16.52				FM	
1B-W-24				NM				NM					Not Installed
2A-W-40		1238		12.38	None	None	WL	12.42				FM	
2A-W-41		1245		12.45	None	None		17.14					
2A-W-42		1346		13.46	16.31		↓	9.65					
2B-W-45				NM				NM					Well abandoned
2B-W-46				NM				NM					Well abandoned
2B-W-47				NM				NM					Not Installed
2B-W-48				NM				NM					Not Installed
3-W-41				NM				NM					Well abandoned
3-W-42				NM				NM					Well abandoned
3-W-43				NM				NM					Well abandoned



Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010				Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
EW-1	03/21/11	1130	NM	9.02	NONE	NONE	WL	9.55				MG	
EW-2				NM				NM					Not Installed
GW-1		1145		9.05	NONE	NONE	WL	9.83				MG	
GW-2		1151		11.55				12.39					
GW-3		1256		10.38				15.73					
GW-4		1304		9.35				10.25					
PZ-1R		NM		NM	NM	NM	NM	10.20					
PZ-2N								11.63					
PZ-2S								9.83					
PZ-3N								13.97					
PZ-3S								10.38					
PZ-4N								14.64					
PZ-4S								11.79					
PZ-5N								10.24					
PZ-5S		1317			9.70	Hwy Tr	T&P	9.93	Hwy Tr			DNK	
PZ-6N		NM			NM	NM	NM	13.29					
PZ-6S		1322			8.30	Hwy Tr	T&P	8.53	Hwy Tr			DNK	
PZ-7N		NM			NM	NM	NM	12.40					
PZ-7S								9.08					
PZ-8								10.20					

FNV  
 WV  
 CV  
 EV  
 PW-04

1305  
 1301  
 1256  
 1245  
 1250

9.26  
 12.65  
 14.74  
 8.84  
 12.53

NONE  
 NONE  
 NONE  
 NONE  
 NONE

WL  
 WL  
 WL  
 WL  
 WL

DNK  
 DNK  
 DNK  
 DNK  
 DNK

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010				Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-3	03/21/11	1451	NM	9.87	-	TR	TOP	10.95	Hwy TR			FM/MG	
MW-7		1458	NM	11.73	NONE	NONE	TOP	13.23	NONE			"	
2A-W-11		-	-	NM	-	-	-	NM				-	Well abandoned
MW-28		1429	NM	13.11	NONE	NONE	TOP	14.55	NONE			FM/MG	
MW-39		-	-	NM	-	-	-	NM				-	Well abandoned
5-W-51		1400	NM	6.97	-	TR	TOP	7.51	TR			FM/MG	
1A-W-2		-	-	NM	NM	NM	NM	NM				-	Not located (in construction zone)
2A-W-4		1501	↓	9.61	NM	Hwy TC	TOP	10.76	Hwy TR			FM/MG	
5-W-2		-	-	NM	-	-	-	NM				-	Well abandoned
5-W-3		-	-	NM	-	-	-	NM				-	Well abandoned
MW-22		-	-	NM	-	-	-	NM				-	Well abandoned

## Other Notes:

- ☒ 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: 60191113 Measured by: Fred Merrill / Mandy Gaddor  
 Number: 60454595-0540

stake ID	date	time	backsight	foresight	water level	comments
SK-1	3/21/11		5.51	15.59		GW-4 used
SK-2			4.42	21.97		1B-W-3 used
SK-3			11.01	17.13		5-W-17 used
SK-4			11.01	17.61		↓ ↓
SK-5			11.01	19.09		↓ ↓
ML-1			—	—	—	
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

## AECOM ENVIRONMENT

## FIELD ACTIVITY LOG

PROJECT BNSF-SkykomishCOMPLETED BY D. KinneyJOB NO. 60191113

APPROVED BY \_\_\_\_\_

DAY & DATE Weds Mar 23, 2011SHEET 1 OF 1FIELD ACTIVITY SUBJECT:  
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:Vault piezometers

TIME	
1305	Took pictures of surface completions
1320	Looking at piezometer casings
	<u>FWU</u> SI-AU → ~12" below top of monument, filed down casing sides, not top
	SI-AD → ~12" below top of monument, not able to file exterior of casing, concrete w/in 1/2" of top of casing, not much burrs
	*SI-BU → casing ~6" below top of monument, filed casing
	*SI-BD → " " " " " " " " " "
	<u>WV</u> S2-AU → " " " " " " " " " "
	S2-AD → " " " " " " " " " "
	*S2-BU → " " " " " " " " " "
	*S2-BD → " " " " " " " " " "
	<u>CV</u> S3-AU → " " " " " " " " " "
	S3-AD → " " " " " " " " " "
	**S3-BU → " " " " " " " " " "
	**S3-BD → " " " " " " " " " "
	S3-CU → casing was not cut (still threaded), not filing
	S3-CD → " " " " " " " " " "
1525	Went to office trailer

VISITORS ON SITE:

CHANGES FROM PALNS OR IMPORTANT DECISIONS:

WEATHER CONDITIONS:

IMPORTANT TELEPHONE CALLS:

\*\* concrete has minor damage  
 \* concrete has at least moderate damage

PERSONNEL ON SITE:

## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	BNSF	Report To:	Sarah Albano	Attention:	Bruce Sheppard
Address:		Copy To:	Renee Knecht	Company Name:	BNSF
				Address:	
Email To:		Purchase Order No.:	TT0100-J39	Pace Quote Reference:	
Phone:		Project Name:	BNSF-Skykamish	Pace Project Manager:	
Requested Due Date/TAT:	std	Project Number:	60191113	Pace Profile #:	
			REGULATORY AGENCY		
			<input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER		
			<input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER		
			Site Location		WA
			STATE:		

[illegible]

	Temp In °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)		
					SAMPLER NAME AND SIGNATURE	
					PRINT Name of SAMPLER:	SIGNATURE of SAMPLER:
W606CU - With the kit	Mindy Gadden AECOM	3/23/11	0800	Bottle Waiver PAGE	03/23/11	
silica gel cleanup						
W/SACU - with silica gel cleanup						
S-W-19-0311; extra sample volume for MS/MSDs				Mindy Gadden	03/23/11	









The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

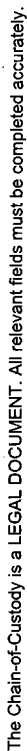
Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	BNSF	Report To:	Sarah Albano	Attention:	Bruce Shappard
Address:		Copy To:	Renee Knecht	Company Name:	BNSF
				Address:	
Email To:		Purchase Order No.:	TT0100 - JRG	Pace Quote Reference:	
Phone:		Project Name:	BNSF-Skykomish	Pace Project Manager:	
Requested Due Date/TAT:	std	Project Number:	60191113	Pace Profile #:	

Page: 1 of 2	1468039	
REGULATORY AGENCY		
<input type="checkbox"/> NPDES	<input checked="" type="checkbox"/> GROUND WATER	<input type="checkbox"/> DRINKING WATER
<input type="checkbox"/> UST	<input type="checkbox"/> RCRA	<input type="checkbox"/> OTHER
Site Location	STATE: WA	

[illegible]

SAMPLER NAME AND SIGNATURE	Temp In °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
S. J. [Signature]				
PRINT Name of SAMPLER:		DATE Signed (MM/DD/YYYY):		
SIGNATURE of SAMPLER:				

E-ALL-Q-020rev 07 15-May-2007



The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	BNSF	Report To:	Seaborn Albano	Attention:	Bruce Sheppard
Address:		Copy To:	Reece Knecht	Company Name:	BNSF
				Address:	
Email To:		Purchase Order No.:	TT0100-139	Pace Quote Reference:	
Phone:		Project Name:	BNSF - Skykay	Pace Project Manager:	
		Project Number:	6019113	Pace Profile #:	
Requested Due Date/TAT:					

Page: 2 of 2	1468033	
REGULATORY AGENCY		
<input type="checkbox"/> NPDES	<input checked="" type="checkbox"/> GROUND WATER	<input type="checkbox"/> DRINKING WATER
<input type="checkbox"/> UST	<input type="checkbox"/> RCRA	<input type="checkbox"/> OTHER
Site Location	WA	STATE:

[illegible]

<div style="text-align: center; font-size: 2em; font-weight: bold;">3</div>	<b>SAMPLER NAME AND SIGNATURE</b>		Temp In °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	<b>PRINT Name of SAMPLER:</b>					
	<b>SIGNATURE of SAMPLER:</b>					
	<b>DATE Signed (MM/DD/YY):</b>					

**\*Important Note:** By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007





# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 3/23/11

Well No. MW-4  
Sampled By DWK  
weather Clear, 35°F

WELL INFORMATION		
Depth to water	8.24	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	N/A	(ft)
Screen interval:		
well condition:	OK	

COMMENTS
Tubing Inlet at ~9.0'

PURGE DATA							
start purge time	1012						
time		1022	1025	1028	1031		
DTW	(ft)	8.28					
purge rate	(L/min)	0.30					
pH	(Units)	5.45	5.42	5.45	5.45		
conductivity	(umhos/cm)	0.111	0.109	0.108	0.104		
temperature	(deg C)	3.8	3.8	3.8	3.8		
D.O.	(mg/L)	3.42	3.27	3.16	3.09		
ORP	(mv)	325	317	310	302		
turbidity	(NTU)	1.75	1.01	0.95	0.99		
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
MW-4-0311	1035	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. MW-16

Sampled By DW/K

weather cloudy, 45 °F

## WELL INFORMATION

Depth to water 12.96 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: None (ft)  
 Screen interval:  
 well condition: ok

## COMMENTS

Duplicate sample collected:  
 MW-160-0311

Tubing inlet at ~13.75'

## PURGE DATA

start purge time	1555						
time		1605	1608	1611			
DTW	(ft)	12.96					
purge rate	(L/min)	0.30					
pH	(Units)	4.58	4.57	4.57			
conductivity	(umhos/cm)	0.040	0.048	0.040			
temperature	(deg C)	5.7	5.7	5.7			
D.O.	(mg/L)	10.85	10.56	10.85			
ORP	(mv)	440	442	444			
turbidity	(NTU)	0.50	0.45	0.44			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
MW-16-0311	1615	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl
MW-160-0311	1630	"	"	"	"
(duplicate)					

# GROUNDWATER SAMPLING LOG

Project No. 60154595-0540

Date \_\_\_\_\_

Well No.

Sampled By

weather

WELL INFORMATION		
Depth to water	4.46	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	None	(ft)
Screen interval:		
well condition:	OK	

[illegible]

PURGE DATA								
start purge time	1455							
time		1505	1508	1511	1514			
DTW	(ft)	4.50	4.50	4.49	4.49			
purge rate	(L/min)	0.30						
pH	(Units)	5.23	5.25	5.22	5.21			
conductivity	(umhos/cm)	0.066	0.068	0.066	0.06			
temperature	(deg C)	7.5	7.5	7.5	7.5			
D.O.	(mg/L)	1.32	1.27	1.23	1.21			
ORP	(mv)	94	93	94	95			
turbidity	(NTU)	1.51	0.85	0.88	0.83			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

[illegible]

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 3/22/11

Well No. 5-W-14  
Sampled By M61  
weather Partly Cloudy 46 °F

WELL INFORMATION	
Depth to water	9.19 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	— (ft)
Screen interval:	
well condition:	OK

COMMENTS
No order

PURGE DATA							
start purge time	0857						
time		0907	0910	0913			
DTW	(ft)	9.19	9.19	9.19			
purge rate	(L/min)	.275	.275	.275			
pH	(Units)	6.06	6.08	6.11			
conductivity	(umhos/cm)	0.054	0.054	0.053			
temperature	(deg C)	7.14	7.11	7.12			
D.O.	(mg/L)	4.52	4.49	4.42			
ORP	(mv)	60.1	59.7	52.7			
turbidity	(NTU)	0.10	0.46	0.08			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
5-W-14-0311	0915	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
11	0915	NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 5-W-15

Sampled By MGA

weather Partly cloudy 48 °F

## WELL INFORMATION

Depth to water 7.69 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: — (ft)  
 Screen interval:  
 well condition: OK

## COMMENTS

Purge started as orange color  
 HC prior

1105 - orange rust color began purging -  
 wait to see if it will stay clear

## PURGE DATA

start purge time	1050						
time		1105	1110	1113	1116	1119	
DTW	(ft)	<del>8.8</del> 7.81	7.81	7.81	7.81	7.81	
purge rate	(L/min)	.3	.3	.3	.3	.3	
pH	(Units)	6.77	6.80	6.82	6.81	6.80	
conductivity	(umhos/cm)	0.199	0.199	0.199	0.200	0.199	
temperature	(deg C)	6.70	6.77	6.78	6.71	6.78	
D.O.	(mg/L)	0.71	0.80	0.73	0.69	0.66	
ORP	(mv)	-44.6	-42.7	-39.3	-42.8	-40.0	
turbidity	(NTU)	117	27.5	11.8	10.1	7.61	
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-15-0311	1120	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
"	1120	NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/32/11

Well No. 5-W-16

Sampled By MG

weather Partly cloudy 44 °F

## WELL INFORMATION

Depth to water	8.00	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	-	(ft)
Screen interval:		
well condition:	OK	

## COMMENTS

No odor

## PURGE DATA

start purge time	0957						
time		1007	1010	1013			
DTW	(ft)	8.00	8.00	8.00			
purge rate	(L/min)	.3	.3	.3			
pH	(Units)	6.26	6.34	6.40			
conductivity	(umhos/cm)	6.067	6.071	6.073			
temperature	(deg C)	6.49	6.46	6.48			
D.O.	(mg/L)	3.38	3.22	3.20			
ORP	(mv)	34.6	33.8	33.9			
turbidity	(NTU)	1.29	0.98	0.75			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-16-0311	1015	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
	1015	NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 5-W-17

Sampled By MG

weather Cloudy, 45°F

## WELL INFORMATION

Depth to water 7.35 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: — (ft)  
 Screen interval:  
 well condition: OK

## COMMENTS

Duplicate sample collected  
 5-W-170-0311

## PURGE DATA

start purge time	1245							
time		1255	1258	1301				
DTW	(ft)	7.36	7.36	7.36				
purge rate	(L/min)	.3	.3	.3				
pH	(Units)	6.34	6.23	6.25				
conductivity	(umhos/cm)	0.057	0.055	0.053				
temperature	(deg C)	7.25	7.26	7.21				
D.O.	(mg/L)	3.03	3.05	3.09				
ORP	(mv)	32.2	37.9	39.5				
turbidity	(NTU)	0.66	0.77	0.72				
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-17-0311	1305	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
	1305	NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl
5-W-17-0311	1205	11	11	11	11
(duplicate)	1205	11	11	11	11
5-W-170-0311					

dup  
label



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 5-W-18

Sampled By DWL

weather Partly cloudy, 40 °F

## WELL INFORMATION

Depth to water 7.57 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: None (ft)  
 Screen interval:  
 well condition: OK

## COMMENTS

Tubing inlet at ~8.75'

## PURGE DATA

start purge time	0848						
time		0858	0901	0904	0907		
DTW	(ft)	7.51					
purge rate	(L/min)	0.30					
pH	(Units)	6.34	6.36	6.37	6.40		
conductivity	(umhos/cm)	0.179	0.179	0.179	0.179		
temperature	(deg C)	5.3	5.3	5.3	5.3		
D.O.	(mg/L)	1.15	1.10	1.08	1.06		
ORP	(mv)	273	268	264	260		
turbidity	(NTU)	6.41	5.49	5.57	5.26		
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-18-0311	09:11	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 5-W-19

Sampled By UNK

weather cloudy, 40°F

## WELL INFORMATION

Depth to water 7.40 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: None (ft)  
 Screen interval:  
 well condition: ok

## COMMENTS

Extra sample volume for lab RC

Tubing inlet at ~8.25'

## PURGE DATA

start purge time	0929						
time	0939	0942	0945				
DTW	(ft) 7.40						
purge rate	(L/min) 0.30						
pH	(Units) 5.86	5.83	5.81				
conductivity	(umhos/cm) 0.069	0.069	0.071				
temperature	(deg C) 6.6	6.6	6.6				
D.O.	(mg/L) 8.67	8.66	8.66				
ORP	(mv) 397	404	406				
turbidity	(NTU) 0.20	0.18	0.15				
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-19-0311	0950	NWTPH-Dx (w/SGCU)	1L Gl. Amber	5	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	5	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 3/22/11

Well No. 5-W-20  
Sampled By pmk  
weather cloudy 45°F

WELL INFORMATION	
Depth to water	6.92 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	None (ft)
Screen interval:	
well condition:	ok

COMMENTS
Tubing inlet at ~7.5'

PURGE DATA							
start purge time	1036						
time		1046	1049	1052			
DTW	(ft)	6.92					
purge rate	(L/min)	0.32					
pH	(Units)	6.46	6.47	6.47			
conductivity	(umhos/cm)	0.47	0.46	0.46			
temperature	(deg C)	5.9	5.9	5.9			
D.O.	(mg/L)	1.40	1.41	1.33			
ORP	(mv)	229	226	225			
turbidity	(NTU)	0.91	0.86	0.85			
purge and sample equip.		Peristaltic pump and silicone/polyethylene tubing					

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
5-W-20-0311	1055	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl





# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. SW-50

Sampled By DNL

weather Cloudy, 45 °F

## WELL INFORMATION

Depth to water 6.97 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: None (ft)  
 Screen interval:  
 well condition: OK

## COMMENTS

Tubing inlet at ~ 7.75'

## PURGE DATA

start purge time	1253						
time		1303	1306	1309			
DTW	(ft)	6.98					
purge rate	(L/min)	0.30					
pH	(Units)	6.55	6.54	6.55			
conductivity	(umhos/cm)	0.192	0.19	0.19			
temperature	(deg C)	5.8	5.8	5.8			
D.O.	(mg/L)	1.32	1.29	1.26			
ORP	(mv)	188	185	181			
turbidity	(NTU)	0.85	0.82	0.80			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-50-0311	1315	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 5-W-51

Sampled By DWK

weather P. Cloudy, 45°F

## WELL INFORMATION

Depth to water 6.97 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: Trace (ft)  
 Screen interval:  
 well condition: ok

## COMMENTS

Tubing inlet at ~7.5'

## PURGE DATA

start purge time	1639							
time								
DTW	(ft)	No parameters -						
purge rate	(L/min)	product in discharge line						
pH	(Units)							
conductivity	(umhos/cm)							
temperature	(deg C)							
D.O.	(mg/L)							
ORP	(mv)							
turbidity	(NTU)							
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-51-0311	1655	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 3/22/11

Well No. 5-W-54  
Sampled By MG  
weather partly cloudy 50°F

WELL INFORMATION	
Depth to water	6.65 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	— (ft)
Screen interval:	
well condition:	OK

COMMENTS
Duplicate sample collected: 5-W-540-0311

PURGE DATA								
start purge time	1351							
time		1401	1404	1407	1410	1413	1415	1418
DTW	(ft)	6.65	6.65	6.65	6.65	6.65	6.65	6.65
purge rate	(L/min)	.3	.3	.3	.3	.3	.3	.3
pH	(Units)	6.26	6.29	6.31	6.26	6.32	6.33	6.36
conductivity	(umhos/cm)	0.077	0.087	0.091	0.093	0.095	0.096	0.098
temperature	(deg C)	6.69	6.74	6.76	6.88	7.07	7.25	7.52
D.O.	(mg/L)	4.20	3.34	3.11	2.85	2.48	2.28	1.79
ORP	(mv)	36.6	34.0	34.3	30.0	25.8	23.8	19.4
turbidity	(NTU)	0.72	0.98	0.59	0.41	0.22	0.11	0.15
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
5-W-54-0311	1435	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl
5-W-540-0311	1400	11	11	11	11
(duplicate)	1400	—	—		

Project No. 60154595-0540

Date 3/22/11

Sampled By MGN

weather partly cloudy 50 °F

## WELL INFORMATION

Depth to water	6.65	(ft)
----------------	------	------

Depth of well: (ft)

Well diameter:	(in)
----------------	------

Feet of water:	(ft)
----------------	------

Product thickness:	—	(ft)
--------------------	---	------

Screen interval:

well condition: OK

## COMMENTS

## PURGE DATA

start purge time
------------------

time

DTW

purge rate

pH

conductivity

temperature

D.O.

ORP

turbidity

purge and sample equip.

1421

104

3

6.36

6.098

7.57

157

18.8

0.10

Peristaltic pump and silicone/polyethylene tubing

## SAMPLE INFORMATION

sample number

**time**

## analysis

**container**

# bottles

**preservative**

S-W-54-0311

1435

NWTPH-Dx

1L Gl. Amber

2

HCl



# GROUNDWATER SAMPLING LOG

Page 1

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 3/23/11

Well No. S-W-56  
Sampled By F. MERRILL  
weather CLEAR 43 °F

WELL INFORMATION	
Depth to water	7.15 (ft)
Depth of well:	(ft)
Well diameter:	(in)
Feet of water:	(ft)
Product thickness:	(ft)
Screen interval:	
well condition:	

COMMENTS

PURGE DATA								
start purge time	0816							
time		0829	0832	0835	0838	0841	0844	0849
DTW	(ft)	7.18	7.19	7.20	7.21	7.23	7.26	7.25
purge rate	(L/min)	250	250	250	267	270	270	271
pH	(Units)	6.01	6.01	5.99	6.02	6.03	6.03	6.04
conductivity	(umhos/cm)	243	255	262	267	269	270	272
temperature	(deg C)	3.30	3.20	3.19	3.21	3.21	3.25	3.44
D.O.	(mg/L)	2.94	2.74	2.27	2.15	1.95	1.65	1.26
ORP	(mv)	163.0	144.1	134.2	124.1	118.4	112.4	96.4
turbidity	(NTU)	16.44	9.23	9.35	3.90	1.31	0.60	0.45
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

→ 250ml/min

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
S-W-56-0311	1910	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl





# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/23/11

Well No. 1A-W-4

Sampled By F. Merriam

weather CLEAR 50 °F  
sunny

## WELL INFORMATION

Depth to water 9.08 (ft)  
Depth of well: (ft)  
Well diameter: (in)  
Feet of water: (ft)  
Product thickness: (ft)  
Screen interval:  
well condition:

## COMMENTS

TURN @ 10.08

## PURGE DATA

start purge time	1257							
time		1307	1310	1313	1316	1319		
DTW	(ft) 9.18	10.18	10.18	10.18	10.18	9.18		
purge rate	(L/min)	200	200	200	200	200		
pH	(Units)	6.37	6.37	6.38	6.35	6.36		
conductivity	(umhos/cm)	78	74	63	66	65		
temperature	(deg C)	7.07	7.08	7.20	7.12	7.20		
D.O.	(mg/L)	6.53	6.31	6.18	6.08	6.01		
ORP	(mv)	254.2	254.0	254.0	254.1	254.3		
turbidity	(NTU)	21.7	5.92	3.28	2.12	1.00		
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
1A-W-4-0311	1320	MWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 1B-W-3

Sampled By F.M.

weather OVERCAST ~ 53 °F

## WELL INFORMATION

Depth to water 14.66 (ft)  
 Depth of well: (ft)  
 Well diameter: (in)  
 Feet of water: (ft)  
 Product thickness: (ft)  
 Screen interval:  
 well condition:

## COMMENTS

## PURGE DATA

start purge time	1500							
time		1513	1516	1519	1522	1525		
DTW	(ft)	14.67	14.67	14.67	14.69	14.69		
purge rate	(L/min)	220	220	220	220	220		
pH	(Units)	6.55	6.43	6.38	6.32	6.39		
conductivity	(umhos/cm)	98	94	93	93	93		
temperature	(deg C)	6.76	6.48	6.48	6.67	6.57		
D.O.	(mg/L)	3.64	4.35	5.00	4.90	4.62		
ORP	(mv)	160.0	166.8	176.4	182.1	183.1		
turbidity	(NTU)	3.20	3.26	4.40	2.74	2.34		
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
1B-W-3-0311	1530	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl







# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 1C-W-3

Sampled By F. MERRELL

weather OVERCAST °F

## WELL INFORMATION

Depth to water 10.45 (ft)  
 Depth of well: (ft)  
 Well diameter: 2" (in)  
 Feet of water: (ft)  
 Product thickness: (ft)  
 Screen interval:  
 well condition:

## COMMENTS

11.45 - TUBING DEPTH

## PURGE DATA

start purge time	1046							
time		1105	1108	1111	1114	1117	1120	1123
DTW	(ft)	10.80	10.80	10.81	10.82	10.82	10.82	10.82
purge rate	(L/min)	100	100	100	100	100	100	100
pH	(Units)	5.90	5.96	6.05	6.00	5.96	5.96	5.96
conductivity	(umhos/cm)	49	50	50	49	50	50	50
temperature	(deg C)	5.26	5.29	5.32	5.22	5.29	5.24	5.36
D.O.	(mg/L)	8.02	7.88	7.71	7.73	7.52	7.46	7.25
ORP	(mv)	283.2	286.4	289.5	293.0	295.0	296.0	300.0
turbidity	(NTU)	NM	43.1	49.6	50.6	29.8	31.3	28.6
purge and sample equip.		Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
1C-W-3-0311	1125	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/22/11

Well No. 1C-W-4

Sampled By FV

weather °F

## WELL INFORMATION

Depth to water 10.12 (ft)  
 Depth of well: (ft)  
 Well diameter: (in)  
 Feet of water: (ft)  
 Product thickness: (ft)  
 Screen interval:  
 well condition:

## COMMENTS

TUBING @ 11.12

## PURGE DATA

start purge time	1303							
time		1316	1319	1322	1325			
DTW	(ft)	10.18	10.26	10.21	10.20			
purge rate	(L/min)	225	225	225	225			
pH	(Units)	5.88	5.87	5.87	5.95			
conductivity	(umhos/cm)	57	57	57	57			
temperature	(deg C)	5.56	5.51	5.49	5.51			
D.O.	(mg/L)	2.44	2.36	2.39	2.31			
ORP	(mv)	294.6	290.1	283.3	280.5			
turbidity	(NTU)	7.36	2.76	0.92	0.64			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
1C-W-4-0311	1330	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl









# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60154595-0540  
Date 3/23/11

Well No. 2A-W-40  
Sampled By F. Merrill  
weather CLEAR/sunny °F

WELL INFORMATION	
Depth to water	11.98 (ft)
Depth of well:	(ft)
Well diameter:	(in)
Feet of water:	(ft)
Product thickness:	(ft)
Screen interval:	
well condition:	

COMMENTS
Duplicate sample collected 2A-W-400-0311

PURGE DATA							
start purge time	1340						
time		1350	1353	1356			
DTW	(ft)	11.99	11.98	11.98			
purge rate	(L/min)	250	250	250			
pH	(Units)	6.31	6.34	6.36			
conductivity	(umhos/cm)	44	43	42			
temperature	(deg C)	6.57	6.67	6.76			
D.O.	(mg/L)	5.92	5.94	5.93			
ORP	(mv)	238.5	237.1	235.1			
turbidity	(NTU)	1.10	0.00	0.75			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
2A-W-40-031	1400	NWTPH-Dx	1L Gl. Amber	2	HCl
2A-W-400-0311 (duplicate)	1300	"	"	"	"





## GROUNDWATER SAMPLING LOG

weather °F

WELL INFORMATION		
Depth to water	12.01	(ft)
Depth of well:		(ft)
Well diameter:		(in)
Feet of water:		(ft)
Product thickness:		(ft)
Screen interval:		
well condition:		

[illegible]

PURGE DATA								
start purge time	1605							
time		1626	1629	1632				
DTW	(ft)	12.01	12.01	12.01				
purge rate	(L/min)	250	250	250				
pH	(Units)	5.93	5.97	5.93				
conductivity	(umhos/cm)	54294	94	94				
temperature	(deg C)	6.88	7.02	7.13				
D.O.	(mg/L)	1.41	1.44	1.46				
ORP	(mv)	193.2	191.6	192.1				
turbidity	(NTU)	2.97	4.27	3.01				
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

[illegible]







# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/24/11

Well No. GW-2

Sampled By DWK

weather Rainy, 40°F

## WELL INFORMATION

Depth to water 11.55 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: None (ft)  
 Screen interval:  
 well condition: ok

## COMMENTS

Tubing inlet at ~ 12.25'

## PURGE DATA

start purge time	time	DTW	purge rate	pH	conductivity	temperature	D.O.	ORP	turbidity
1531	1541	11.58	0.30	5.73	0.187	6.2	2.04	155	14
	1544	11.58		5.88	0.177	6.2	2.09	159	13
	1547	11.58		5.97	0.175	6.2	2.57	196	11
	1550	11.58		5.95	0.171	6.1	2.59	205	10.6
purge and sample equip. Peristaltic pump and silicone/polyethylene tubing									

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
GW-2-0311	1555	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/21/11

Well No. GW-3

Sampled By DWK

weather Rainy, 40 °F

## WELL INFORMATION

Depth to water 16.38 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: None (ft)  
 Screen interval:  
 well condition: OK

## COMMENTS

Duplicate sample  
 collected: GW-30-0311  
 Tabling Inlet at ~17.0'

## PURGE DATA

start purge time	1616				
time		1626	1639	1652	1655
DTW	(ft)	16.39			
purge rate	(L/min)	0.30			
pH	(Units)	5.37	5.34	5.34	5.36
conductivity	(umhos/cm)	0.046	0.042	0.044	0.047
temperature	(deg C)	7.3	7.4	7.4	7.4
D.O.	(mg/L)	7.95	7.95	7.96	7.97
ORP	(mv)	422	431	435	437
turbidity	(NTU)	2.01	0.60	0.55	0.54
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing				

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
GW-3-0311	1640	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl
GW-30-0311	1655	"	"	"	"



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60154595-0540

Date 3/23/11

Well No. GW-A

Sampled By DUK

weather clear, 30 °F

## WELL INFORMATION

Depth to water 9.52 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: none (ft)  
 Screen interval:  
 well condition: o/c

## COMMENTS

Tubing inlet at ~10.25'

## PURGE DATA

start purge time	08:23						
time		0833	0836	0839	0842	0845	0848
DTW	(ft)	9.76	9.77	9.77	9.78	9.78	9.79
purge rate	(L/min)	0.30					
pH	(Units)	5.30	5.32	5.33	5.33	5.34	5.34
conductivity	(umhos/cm)	0.145	0.144	0.142	0.141	0.141	0.140
temperature	(deg C)	6.0	6.0	6.0	6.0	6.1	6.1
D.O.	(mg/L)	3.10	3.03	3.01	2.97	2.94	2.93
ORP	(mv)	405	395	379	371	368	365
turbidity	(NTU)	8.55	7.10	3.65	3.00	2.85	2.71
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
GW-4-0311	0850	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

## AECOM ENVIRONMENT

## FIELD ACTIVITY LOG

PROJECT BNSF-Sky KomishCOMPLETED BY D. KinneyJOB NO. 6019113

APPROVED BY \_\_\_\_\_

DAY & DATE Mon. Mar 21<sup>st</sup> 2011SHEET 1 OF 2

## FIELD ACTIVITY SUBJECT:

## DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

GW Gauging &amp; Sampling

TIME	
0815	Arrived onsite & setup to sample
0905	Gauged 2B-W-4, calibrating VSI (model 55) & Lamotte (model 100) meters
0910	started purging 2B-W-4
0930	sampled 2B-W-4 for NWTPH-Dx
0940	Gauging railroad wells
1000	met w/ Mindy; safety briefing
1020	Gauging wells
1040	met w/ Fred; safety briefing
1045	continued gauging
1125	Helped find 5-W-43
1145	went to lunch
1225	Returned from lunch; Fred & Mindy gauging MW's; I will do vaults
1339	Started purging 5-W-43
1400	sampled 5-W-43 (same as 2B-W-4)
1422	Started purging GW-1
1440	sampled GW-1 (same as 2B-W-4)
1455	Started purging MW-38R
1515	sampled MW-38R (same as 2B-W-4)
1531	Started purging GW-2
1555	sampled GW-2 (same as 2B-W-4)
1616	Started purging GW-3

## VISITORS ON SITE:

None

## CHANGES FROM PLANS OR IMPORTANT DECISIONS:

None

## WEATHER CONDITIONS:

Raining, 35-45°F

## IMPORTANT TELEPHONE CALLS:

None

## PERSONNEL ON SITE:

Dean Kinney, Fred Merrill &amp; Mindy Gradlon

## FIELD ACTIVITY LOG

COMPLETED BY D. Kinney

APPROVED BY \_\_\_\_\_

SHEET 2 OF 2

**DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:**

## GW Sampling

[illegible]

No 2

None

Cloudy to Rainy, 40-48

Name \_\_\_\_\_

See Pg 1

## AECOM ENVIRONMENT

## FIELD ACTIVITY LOG

PROJECT BNSF-Skykomish COMPLETED BY D. Kinney  
 JOB NO. 6019113 APPROVED BY \_\_\_\_\_  
 DAY & DATE Tues Mar 22<sup>nd</sup> 2011 SHEET 1 OF 2

FIELD ACTIVITY SUBJECT: DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:	
TIME	GW Sampling
0735	Arrived onsite & had safety mtg
0750	Organizing Van
0755	Calibrating meters (VSI-model 556 & Lutron-model 2020) - couldn't get to calibrate until second time.
0842	started purging 5-W-18
0910	Sampled 5-W-18 for NWTPH-DX
0929	Started purging 5-W-19
0950	Sampled 5-W-19 (same as 5-W-18)
1036	Started purging 5-W-20
1055	Sampled 5-W-20 (same as 5-W-18)
1115	Started purging 5-W-42
1135	Sampled 5-W-42 (same as 5-W-18)
1150	Lunch
1235	Returned from lunch & setup on
1253	Started purging 5-W-50
1315	Sampled 5-W-50 (same as 5-W-18)
1325	Went to dump purge water at treatment bldg
1350	Started purging EW-1
1410	Sampled EW-1 for NWTPH-DX
1430	Went to get Mindy loaded for lab
1555	Started purging MW-16, mindy left site
1615	Sampled MW-16 (same as EW-1); took dupll site 'labeled' MW16-0311
VISITORS ON SITE:	CHANGES FROM PALNS OR IMPORTANT DECISIONS:
None	None
WEATHER CONDITIONS:	IMPORTANT TELEPHONE CALLS:
Raining to Cloudy, 35-45°F	None
PERSONNEL ON SITE: Dean Kinney, Fred Merrill & Mindy Graddon	

## AECOM ENVIRONMENT

## FIELD ACTIVITY LOG

PROJECT BNSF-Skykomish

COMPLETED BY A. Jones

JOB NO. 60191113

APPROVED BY \_\_\_\_\_

DAY & DATE Tues. Mar 22<sup>nd</sup>, 2011

SHEET 2 OF 2

[illegible]

## AECOM ENVIRONMENT

## FIELD ACTIVITY LOG

PROJECT BNSF-SkykomishCOMPLETED BY D. KinneyJOB NO. 60191113

APPROVED BY \_\_\_\_\_

DAY & DATE Wed Mar 23<sup>rd</sup> 2011SHEET 1 OF \_\_\_\_\_

## FIELD ACTIVITY SUBJECT:

## DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

GW Sampling

TIME	
0730	Arrived onsite
0735	Safety Mtg
0745	Calibrating meters - K&L (model 550 & LaMotte Model 2020)
0823	started purging GW-4
0850	Sampled GW-4 for NWTPH-DX
0930	started purging MW-3
0950	sampled MW-3 for NWTPH-DX
1012	started purging MW-4
1035	sampled MW-4 for NWTPH-DX
1040	started purging ZA-W-10
1100	sampled ZA-W-10 for NWTPH-DX
1145	started purging ZA-W-9 after grabbing lunch
1205	sampled ZA-W-9 for NWTPH-DX
1215	Pumping purge water into treatment system
1255	checked w/Fred & then went to look at vault piezo's
1305	Took pictures of vault piezo's
1320	Filling vault piezometers
1530	Went to pump rest of purge water
1545	Dropped cooler at bunkhouse
1550	left site

## VISITORS ON SITE:

None

## CHANGES FROM PLANS OR IMPORTANT DECISIONS:

None

## WEATHER CONDITIONS:

Clear, 30-45°F

## IMPORTANT TELEPHONE CALLS:

None

## PERSONNEL ON SITE:

Dean Kinney, Fred Marshall

## Fluid Level Gauging Form

Project Name: BNSF Skykomish		Project Number: 60191113		Collected by: D. Klancy, F. Merrill, M. Gradden		9/20/2010							
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
1A-W-4	03/21/11	1309	NM	8.88	None	None	WL	9.47				FM	
1A-W-5				NM				NM					Well abandoned
1A-W-38				NM				NM					Not installed
1B-W-2		1318		14.54	None	None	WL	13.51				FM	
1B-W-3		1323		14.58				14.91				FM	
1C-W-1		1322		13.02				13.63				MG	
1C-W-2				NM				NM					Well destroyed during sewer work
1C-W-3		1333		10.38	None	None	WL	10.87				FM	
1C-W-4		1335		10.06				10.45				FM	
1C-W-7		1313		10.75				11.52				MG	
1C-W-8		1329		10.31				12.98				MG	
2A-W-5		1035		11.94				13.95				MG	
2A-W-7		1108		11.01				11.81					
2A-W-8		1055		14.13				15.00					
2A-W-9		0948		9.78				11.41					
2A-W-10		0945		9.47				11.54					
2B-W-4		0905		2.25				3.81					
5-W-4				NM				NM					Well abandoned
5-W-14		1010		9.19	None	None	WL	9.19				MG	
5-W-15		1030		7.67				7.75					
5-W-16		1042		8.00				8.02					
5-W-17		1025		7.36				7.35					
5-W-18		1045		7.47				7.52					
5-W-19		1049		7.36				7.44					
5-W-20		1005		6.90				7.00					
5-W-42		1052		6.56				6.75					
5-W-43		1337		6.96				NM					
5-W-44				NM				NM					Not installed
5-W-50		1036		6.86	None	None	WL	7.24				MG	
5-W-52				NM				NM					Well abandoned
5-W-53				NM				NM					Well abandoned
5-W-54		1133		6.48	None	None	WL	6.85				FM	
5-W-55		1125		6.27				6.42					
5-W-56		1129		7.02				6.58					



Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010				Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
MW-1	03/21/11	1043	NM	11.85	None	None	WL	13.09				DWK	
MW-2		1101		11.35				12.70					
MW-3		0930		7.80				10.78					
MW-4		0542		7.84				10.12					
MW-5		0950		6.54				8.18					
MW-9		1123		11.25				13.32					
MW-10		1120		11.32				13.10					
MW-11		1116		12.00	12.02	Trace	↓/top	13.73					
MW-12				NM				NM					Well abandoned
MW-12R				NM				NM					Not Installed
MW-13		1021	NM	9.01	None	None	WL	10.31				DWK	
MW-14		1023	NM	10.96				12.28					
MW-15		1029		12.09				13.52					
MW-16		1126		12.81				13.57					
MW-18		1035		13.35				15.10					
MW-32		1258		8.88				9.19				FM	
MW-38R		1120		4.43				4.92				DWK	FM
MW-40		1026		11.59				12.98					
1A-W-36				NM				NM					Not Installed
1A-W-37				NM				NM					Not Installed
1B-W-23		1252		16.29	None	None	WL	16.52				FM	
1B-W-24				NM				NM					Not Installed
2A-W-40		1238		12.38	None	None	WL	12.42				FM	
2A-W-41		1245		12.45	None	None		17.14					
2A-W-42		1346		13.46	13.88		↓	9.65					
2B-W-45				NM				NM					Well abandoned
2B-W-46				NM				NM					Well abandoned
2B-W-47				NM				NM					Not Installed
2B-W-48				NM				NM					Not Installed
3-W-41				NM				NM					Well abandoned
3-W-42				NM				NM					Well abandoned
3-W-43				NM				NM					Well abandoned

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010				Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
EW-1	03/21/11	1130	NM	9.02	NONE	NONE	WL	9.55				MG	
EW-2				NM				NM					Not Installed
GW-1		1145		9.05	NONE	NONE	WL	9.83				MG	
GW-2		1151		11.55				12.39					
GW-3		1256		10.38				15.73					
GW-4		1304		9.35				10.25					
PZ-1R		NM		NM	NM	NM	NM	10.20					
PZ-2N								11.63					
PZ-2S								9.83					
PZ-3N								13.97					
PZ-3S								10.38					
PZ-4N								14.64					
PZ-4S								11.79					
PZ-5N								10.24					
PZ-5S		1317			9.70	Hwy Tr	T&P	9.93	Hwy Tr			DNK	
PZ-6N		NM			NM	NM	NM	13.29					
PZ-6S		1322			8.30	Hwy Tr	T&P	8.53	Hwy Tr			DNK	
PZ-7N		NM			NM	NM	NM	12.40					
PZ-7S								9.08					
PZ-8								10.20					

FNV 1305  
 WV 1301  
 CV 1256  
 EV 1245  
 PW-04 1250

9.26  
 12.65  
 14.74  
 8.84  
 12.53

NONE  
 NONE  
 NONE  
 NONE  
 NONE

WL  
 WL  
 WL  
 WL  
 WL

DNK  
 DNK  
 DNK  
 DNK  
 DNK

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010				Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-3	03/21/11	1451	NM	9.87	-	TR	TOP	10.95	Hvy TR			FM/MG	
MW-7		1458	NM	11.73	NONE	NONE	TOP	13.23	NONE			"	
2A-W-11		-	-	NM	-	-	-	NM				-	Well abandoned
MW-28		1429	NM	13.11	NONE	NONE	TOP	14.55	NONE			FM/MG	
MW-39		-	-	NM	-	-	-	NM				-	Well abandoned
5-W-51		1400	NM	6.97	-	TR	TOP	7.51	TR			FM/MG	
1A-W-2		-	-	NM	NM	NM	NM	NM				-	Not located (in construction zone)
2A-W-4		1501	↓	9.61	NM	Hvy TR	TOP	10.76	Hvy TR			FM/MG	
5-W-2		-	-	NM	-	-	-	NM				-	Well abandoned
5-W-3		-	-	NM	-	-	-	NM				-	Well abandoned
MW-22		-	-	NM	-	-	-	NM				-	Well abandoned

## Other Notes:

- ☒ dirty casing, possible trace product  
☒ use tape and paste (TP)  
☒ use tape & paste (TP) + peristaltic pump (PP)  
☒ dirty well

# River Gauging Form

Project Name: BNSF Skykomish Project Number: 60191113 Measured by: Fred Merrill / Mandy Gaddor  
 Number: 60454595-0540

stake ID	date	time	backsight	foresight	water level	comments
SK-1	3/21/11		5.51	15.59		GW-4 used
SK-2			4.42	21.97		1B-W-3 used
SK-3			11.01	17.13		5-W-17 used
SK-4			11.01	17.61		↓ ↓
SK-5			11.01	19.09		↓ ↓
ML-1			—	—	—	
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: 60191113		Collected by: D. Kinney		9/20/2010		Sign Off	Comments						
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)		
1A-W-4	03/21/11									9.47					
1A-W-5				NM						NM					Well abandoned
1A-W-38				NM						NM					Not Installed
1B-W-2										13.51					
1B-W-3										14.91					
1C-W-1										13.63					
1C-W-2				NM						NM					Well destroyed during sewer work
1C-W-3										10.87					
1C-W-4										10.45					
1C-W-7										11.52					
1C-W-8										12.98					
2A-W-5		1038	NM	11.94	NM	NM	WL			13.95					DNR
2A-W-7		1108		11.01						11.81					
2A-W-8		1055		14.13						15.00					
2A-W-9		0948		9.48						11.41					
2A-W-10		0945		9.47						11.54					
2B-W-4		0945		7.25						3.81					
5-W-4				NM						NM					Well abandoned
5-W-14										9.19					
5-W-15										7.75					
5-W-16										8.02					
5-W-17										7.35					
5-W-18										7.52					
5-W-19										7.44					
5-W-20										7.00					
5-W-42										6.75					
5-W-43		1337	NM	6.96	NM	NM	WL			NM					DNR
5-W-44				NM						NM					Not Installed
5-W-50										7.24					
5-W-52				NM						NM					Well abandoned
5-W-53				NM						NM					Well abandoned
5-W-54										6.85					
5-W-55										6.42					
5-W-56										6.58					

## Fluid Level Gauging Form

Project Name: BNSF Skykomish		Project Number: 60191113		Collected by: FRED MERRILL											
Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010		DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)	Sign Off	Comments
1A-W-4	03/21/11	1309		8.68						9.47					
1A-W-5				NM						NM					Well abandoned
1A-W-38				NM						NM					Not installed
1B-W-2	3/21	1318		17.54						13.51					
1B-W-3	3/21	1323		14.58						14.91					
1C-W-1										13.63					
1C-W-2				NM						NM					Well destroyed during sewer work
1C-W-3		1333		10.06	10.38					10.87					
1C-W-4		1335		10.25	10.06					10.45					
1C-W-7										11.52					
1C-W-8										12.98					
2A-W-5										13.95					
2A-W-7										11.81					
2A-W-8										15.00					
2A-W-9										11.41					
2A-W-10										11.54					
2B-W-4										3.81					
5-W-4				NM						NM					Well abandoned
5-W-14										9.19					
5-W-15										7.75					
5-W-16										8.02					
5-W-17										7.35					
5-W-18										7.52					
5-W-19										7.44					
5-W-20										7.00					
5-W-42										6.75					
5-W-43										NM					
5-W-44										NM					Not installed
5-W-50										7.24					
5-W-52										NM					Well abandoned
5-W-53										NM					Well abandoned
5-W-54	3/21/11	1125	1133	7.02	16.48					6.85					
5-W-55	3/21/11	1125		6.27						6.42					
5-W-56	3/21/11	1129		7.02						6.58					

MW-32 3/21/11 1258

8.88

## Fluid Level Gauging Form

Project Name: BNSF Skykomish

Project Number: 60191113

Collected by: M. Graddon

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)		
1A-W-4	03/21/11							9.47			
1A-W-5				NM				NM			Well abandoned
1A-W-38				NM				NM			Not installed
1B-W-2								13.51			
1B-W-3								14.91			
1C-W-1		13:22		13.02				13.63			
1C-W-2				NM				NM			Well destroyed during sewer work
1C-W-3								10.87			
1C-W-4								10.45			
1C-W-7		13:13		10.75				11.52			
1C-W-8		13:29		12.31				12.98			
2A-W-5								13.95			
2A-W-7								11.81			
2A-W-8								15.00			
2A-W-9								11.41			
2A-W-10								11.54			
2B-W-4								3.81			
5-W-4				NM				NM			Well abandoned
5-W-14	3/21/11	10:16	18.40	9.19				9.19			
5-W-15	3/21/11	10:30		7.67				7.75			
5-W-16		10:42		8.00				8.02			
5-W-17	3/21/11	10:55		7.36				7.35			
5-W-18		10:45		7.47				7.52			
5-W-19		10:47		7.36				7.44			
5-W-20		10:50		10.56				7.00			Time 10:56 Depth 10.90
5-W-42		10:55		6.56				6.75			
5-W-43								NM			
5-W-44				NM				NM			Not installed
5-W-50		10:36		10.86				7.24			
5-W-52				NM				NM			Well abandoned
5-W-53				NM				NM			Well abandoned
5-W-54								6.85			
5-W-55								6.42			
5-W-56								6.58			



Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010			Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)		
MW-1	03/21/11	1043	NM	11.85	None	None	WL	13.09			DWK	
MW-2		1101		11.35				12.70				
MW-3		0933		7.80				10.78				
MW-4		0942		7.84				10.12				
MW-5		0950		6.54				8.18				
MW-9		1123		11.75				13.32				
MW-10		1120		11.32				13.10				
MW-11		1116		12.00				13.73				
MW-12				NM				NM				Well abandoned
MW-12R				NM				NM				Not Installed
MW-13		1021		9.01	None	None	WL	10.31				
MW-14		1023		10.96				12.28				
MW-15		1029		12.09				13.52				
MW-16		1176		12.81				13.57				
MW-18		1035		13.35				15.10				
MW-32								9.19				
MW-38R								4.92				
MW-40		1026		11.59				12.98			DWK	
1A-W-36				NM				NM				Not Installed
1A-W-37				NM				NM				Not Installed
1B-W-23								16.52				
1B-W-24				NM				NM				Not Installed
2A-W-40								12.42				
2A-W-41								17.14				
2A-W-42								9.65				
2B-W-45				NM				NM				Well abandoned
2B-W-46				NM				NM				Well abandoned
2B-W-47				NM				NM				Not Installed
2B-W-48				NM				NM				Not Installed
3-W-41				NM				NM				Well abandoned
3-W-42				NM				NM				Well abandoned
3-W-43				NM				NM				Well abandoned

PM

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Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010				Sign Off	Comments
								DTW (ft)	Prod. Thick (ft)	DTW (ft)	Prod. Thick (ft)		
MW-1	03/21/11							13.09					
MW-2								12.70					
MW-3								10.78					
MW-4								10.12					
MW-5								8.18					
MW-9								13.32					
MW-10								13.10					
MW-11								13.73					
MW-12		—		NM				NM					Well abandoned
MW-12R		—		NM				NM					Not Installed
MW-13								10.31					
MW-14			13.5					12.28					
MW-15								13.52					
MW-16								13.57					
MW-18								15.10					
MW-32								9.19					
MW-38R	3/21/11	1:20		4.43				4.92					
MW-40								12.98					
1A-W-36		—		NM				NM					Not Installed
1A-W-37		—		NM				NM					Not Installed
1B-W-23		1:52		16.22				16.52					
1B-W-24		—		NM				NM					Not Installed
2A-W-40	3/21/11	12:38		11.84				12.42					
2A-W-41		12:45		16.31				17.14					
2A-W-42		13:46		11.88				9.65					
2B-W-45		—		NM				NM					Well abandoned
2B-W-46		—		NM				NM					Well abandoned
2B-W-47		—		NM				NM					Not Installed
2B-W-48		—		NM				NM					Not Installed
3-W-41		—		NM				NM					Well abandoned
3-W-42		—		NM				NM					Well abandoned
3-W-43		—		NM				NM					Well abandoned

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010				Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
EW-1	03/21/11		NM					9.55					
EW-2				NM				NM					Not Installed
GW-1								9.83					
GW-2								12.39					
GW-3								15.73					
GW-4								10.25					
PZ-1R			NM	NM	NM	NM		10.20					
PZ-2N								11.63					
PZ-2S								9.83					
PZ-3N								13.97					
PZ-3S								10.38					
PZ-4N								14.64					
PZ-4S								11.79					
PZ-5N								10.24					
PZ-5S					9.70	Hwy Tr	T & P	9.93	Hwy Tr			DWK	
PZ-6N					NM	NM		13.29					
PZ-6S					8.30	Hwy Tr	T & P	8.53	Hwy Tr			DWK	
PZ-7N					NM	NM		12.40					
PZ-7S								9.08					
PZ-8								10.20					

FWU 1305  
 WV 1301  
 EV 1256  
 EV 1245  
 PW-04 1250

9.26  
 12.65  
 14.74  
 8.84  
 12.53

None  
 None  
 None

WL  
 ↓  
 ↓  
 ↓  
 ↓

MC

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010			Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)		
EW-1	03/21/11	1130		9.02				9.55				
EW-2				NM				NM				Not Installed
GW-1		1145		9.05				9.83				
GW-2		1151		11.55				12.39				
GW-3		1256		15.38				15.73				
GW-4		1304		9.35				10.25				
PZ-1R								10.20				
PZ-2N								11.63				
PZ-2S								9.83				
PZ-3N								13.97				
PZ-3S								10.38				
PZ-4N								14.64				
PZ-4S								11.79				
PZ-5N								10.24				
PZ-5S								9.93	Hvy Tr			
PZ-6N								13.29				
PZ-6S								8.53	Hvy Tr			
PZ-7N								12.40				
PZ-7S								9.08				
PZ-8								10.20				

FM/MG

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Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2010				Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-3	03/21/11	1451		9.87			TP	10.95	Hvy TR				Trace Product
MW-7		1438		11.73			TP	13.23	None				1233-05 No Prod
2A-W-11		1406		NM				NM					Well abandoned
MW-28		1420		13.11			TP	14.55	None				No product
MW-39				NM				NM					Well abandoned
S-W-51		1400	6.77	6.97			TP	7.51	TR				Not trace of product
1A-W-2								NM					Not located (in construction zone)
2A-W-4		1501		9.61			TP	10.76	Hvy TR				Heavy Trace
S-W-2				NM				NM					Well abandoned
S-W-3				NM				NM					Well abandoned
MW-22				NM				NM					Well abandoned

Other Notes:

- ☒ dirty casing, possible trace product      use tape and paste (TP)
- ☒ dirty well      use tape & paste (TP) + peristaltic pump (PP)

## AECOM ENVIRONMENT

## FIELD ACTIVITY LOG

PROJECT BNSF-SkykomishCOMPLETED BY D. KinneyJOB NO. 60191113

APPROVED BY \_\_\_\_\_

DAY & DATE Weds Mar 23, 2011SHEET 1 OF 1FIELD ACTIVITY SUBJECT:  
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:Vault piezometers

TIME	
1305	Took pictures of surface completions
1320	Looking at piezometer casings
	<u>FWU</u> SI-AU → ~12" below top of monument, filed down casing sides, not top
	SI-AD → ~12" below top of monument, not able to file exterior of casing, concrete w/in 1/2" of top of casing, not much burrs
	*SI-BU → casing ~6" below top of monument, filed casing
	*SI-BD → " " " " " " " " " "
	<u>WV</u> SZ-AU → " " " " " " " " " "
	SZ-AD → " " " " " " " " " "
	*SZ-BU → " " " " " " " " " "
	*SZ-BD → " " " " " " " " " "
	<u>CV</u> S3-AU → " " " " " " " " " "
	S3-AD → " " " " " " " " " "
	**S3-BU → " " " " " " " " " "
	**S3-BD → " " " " " " " " " "
	S3-CU → casing was not cut (still threaded), not filing
	S3-CD → " " " " " " " " " "
1525	Went to office trailer

VISITORS ON SITE:

CHANGES FROM PALNS OR IMPORTANT DECISIONS:

WEATHER CONDITIONS:

IMPORTANT TELEPHONE CALLS:

\*\* concrete has minor damage  
 \* concrete has at least moderate damage

PERSONNEL ON SITE:



## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	AECOM	Report To:	DEAN KINNEY	Attention:	BNSF
Address:	710 2 <sup>ND</sup> AVE STE 1000	Copy To:		Company Name:	
				Address:	
				Pace Quote Reference:	
				Pace Project Manager:	
				Pace Profile #:	
Email To:	DEAN.KINNEY@AECOM.COM	Purchase Order No.:			
Phone:	206-403-4913	Project Name:	BNSF-SKYKEMISH		
Fax:		Project Number:	60191113-0530		
Requested Due Date/TAT:	STANDARD				

Page: 1 of 4


1470737

REGULATORY AGENCY  
☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER  
☐ UST ☐ RORA ☐ OTHER \_\_\_\_\_

Site Location

STATE: \_\_\_\_\_

Section D Required Client Information		Matrix Codes MATRIX / CODE		Matrix Codes DW WT WW P SL OL WP AR TS OT		MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	Preservatives		Y/N	Requested Analysis Filtered (Y/N)												Pace Project No./ Lab I.D.									
ITEM #	Sample ID (A-Z, 0-9 / -)	Drinking Water	Water	Waste Water	Product	Soil/Solid	Oil	Wipe	Air	Tissue	Other	WT	G	DATE	TIME	DATE	TIME	COMPOSITE START	COMPOSITE END/GRAB	TIME	# OF CONTAINERS	Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other	Analysis Test	DATE	TIME	SAMPLE CONDITIONS		
1	1C-W-7-0411											WT	G	4/27/11	1135																				
2	1C-W-8-0411											WT	G	4/27/11	1400																				
3	1C-W-1-0411											WT	G	4/27/11	1320																				
4	1C-W-70-0411											WT	G	4/27/11	1035																				
5																																			
6																																			
7																																			
8																																			
9																																			
10																																			
11																																			
12																																			
ADDITIONAL COMMENTS												RELINQUISHED BY / AFFILIATION		DATE	TIME	ACCEPTED BY / AFFILIATION		DATE	TIME	SAMPLE CONDITIONS															
Direct Bill to BNSF												FACS Mearns		4/28/11	0932	Coley Weaver / PACE		042811	0932																

2	SAMPLER NAME AND SIGNATURE		Temp in °C Received on Ice (Y/N) Custody Sealed Cooler (Y/N) Samples Intact (Y/N)
	PRINT Name of SAMPLER: FRED McELIC		
	SIGNATURE of SAMPLER: 		
	DATE Signed (MM/DD/YY): 4/28/11		

F-ALL-Q-020rev.07. 15-May-2007



Well ID: 1C-W-1  
Sample ID: 1C-W-1-0411  
Well Condition: Good.

Initial Depth to Water\* (ft): 13.28  
 Depth to Product\* (ft): —  
 Product Thickness (ft): —  
 Water Column (ft): —  
 Inner Casing Diameter (Inch): 2  
 Water Volume in Well (gal): —  
 Inner Casing Material: PVC  
 Start Purge Time: 1240

Purge/Sample Method:	low-flow
Purge/Sample Equipment	Peristaltic Pump
Screened Interval Depth Range* (ft)	
Tubing Inlet Depth* (ft):	14.50'
Total Well Depth* (feet):	
sampling tube material	polyethylene, silicone

[illegible]

Sample ID	sample time	Analysis	Method	Container	No. of bottles	Preservative
1C-W-1-0411	1320	NWTPH-Dx w/o SGCU		1L Gl. Amber	2	HCL

Dissolved Oxygen: +/- 10%  
Conductivity: +/- 10%  
Temperature: +/- 10 %  
pH: +/- 0.1 unit  
Redox Potential: +/- 10%  
Turbidity: +/- 10%

[illegible]

Field parameter meter calibration results are recorded in the field book.

$$1 \text{ gal} = 3785.4 \text{ mL}$$

Well ID: 1C-W-7  
Sample ID: 1C-W-7-0411  
Well Condition: Good

Initial Depth to Water* (ft):	11.09
Depth to Product* (ft):	—
Product Thickness (ft):	—
Water Column (ft):	
Inner Casing Diameter (Inch):	2
Water Volume in Well (gal):	
Inner Casing Material:	PVC
Start Purge Time:	1105

Purge/Sample Method:	low-flow
Purge/Sample Equipment	Peristaltic Pump
Screened Interval Depth Range* (ft)	
Tubing Inlet Depth* (ft):	12.10
Total Well Depth* (feet):	
sampling tube material	polyethylene, silicone

[illegible]

Sample ID	sample time	Analysis	Method	Container	No. of bottles	Preservative
1C-W-7-0411	1135	NWTPH-Dx w/o SGCU		1L Gl. Amber	2	HCL
1C-W-70-0411	1035	NWTPH-Dx		1L Gl Amber	2	HCL

Dissolved Oxygen: +/- 10%  
Conductivity: +/- 10%  
Temperature: +/- 10 %  
pH: +/- 0.1 unit  
Redox Potential: +/- 10%  
Turbidity: +/- 10%

Collected Duplicate 1C-W-70-0411 @ 1035.

Field parameter meter calibration results are recorded in the field book.

1 gal = 3785.4 mL

Well ID: 1C-W-8  
Sample ID: 1C-W-8-0471  
Well Condition: Good.

Initial Depth to Water* (ft):	12.61
Depth to Product* (ft):	-
Product Thickness (ft):	-
Water Column (ft):	
Inner Casing Diameter (Inch):	2
Water Volume in Well (gal):	
Inner Casing Material:	PVC
Start Purge Time:	1330

Purge/Sample Method:	low-flow
Purge/Sample Equipment	Peristaltic Pump
Screened Interval Depth Range* (ft)	
Tubing Inlet Depth* (ft):	13.60
Total Well Depth* (feet):	
sampling tube material	polyethylene, silicone

[illegible]

Sample ID	sample time	Analysis	Method	Container	No. of bottles	Preservative
1C-W-8-0411	1400	NWTPH-Dx w/o SGCU		1L Gl. Amber	2	HCL

Dissolved Oxygen: +/- 10%  
Conductivity: +/- 10%  
Temperature: +/- 10 %  
pH: +/- 0.1 unit  
Redox Potential: +/- 10%  
Turbidity: +/- 10%

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Field parameter meter calibration results are recorded in the field book.

1 gal = 3785.4 mL

JOB TITLE \_\_\_\_\_  
 JOB NO. \_\_\_\_\_ CALCULATION NO. \_\_\_\_\_  
 ORIGINATOR \_\_\_\_\_ DATE \_\_\_\_\_  
 REVIEWER \_\_\_\_\_ DATE \_\_\_\_\_  
 SCALE \_\_\_\_\_ SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

## GWSAMPING LOG FOR 1C-W-8

DATE: 4/27/11

INITIAL DTW: 12.61

BE TIME BEGINNING PURGE:

SAMPLER:

WEATHER:

PROJECT:

TIME

DTW

TEMP

COND

DO

pH

ORP

TURB

FLOW RATE

1346	1352	1355	1358
12.62	12.62	12.62	12.62
8.62	8.60	8.48	8.48
0.055	0.054	0.056	0.055
1.89	1.71	1.73	1.70
5.42	5.48	5.49	5.49
377.6	363.8	359.7	358.0
1.36	1.16	2.48	2.14
200	200	200	200

SAMPLE ID 1C-W-8-0411  
 TIME: 1400

JOB TITLE \_\_\_\_\_  
 JOB NO. \_\_\_\_\_ CALCULATION NO. \_\_\_\_\_  
 ORIGINATOR \_\_\_\_\_ DATE \_\_\_\_\_  
 REVIEWER \_\_\_\_\_ DATE \_\_\_\_\_  
 SCALE \_\_\_\_\_ SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

## 1C-W-7 6W SAMPLING LOG

DATE: 4/27/11

TIME BEGINNING PURGE: 1105

INITIAL DTW: 11.09

SAMPLER: F. MERRILL

WEATHER: OVERCAST

PROJECT: BNSF SKYKOMISH MONTHLY AIRSPARGE

TIME	1124	1127	1130	1133		
DTW	11.11	11.11	11.11			
FLOW RATE Temp	8.04	7.91	7.84	7.79		
D.O.	2.24	2.19	2.17	2.16		
PH	5.11	5.13	5.07	5.10		
ORP	201.1	202.0	208.2	216.9		
TURBIDITY	7.08	4.39	4.36	4.51		
FLOW RATE	200	200	200	200		
COND	0.088	0.080	0.081	0.082		

SAMPLE ID

1C-W-7-0411

2 BOTTLES 1 L AMB

NWTPH-DX

TIME: 1135

1C-W-7-0411

2 BOTTLES 1 L AMB

1035

COLLECT DUP @ 1C-W-7

## 1C-W-1 6W SAMPLING LOG

INITIAL DTW: 13.28

DATE: 4/27/11

TIME BEGINNING PURGE: 1240

SAMPLER: F. MERRILL

WEATHER: OVERCAST

PROJECT: BNSF SKYKOMISH MONTHLY AIRSPARGE

TIME	1309	1312	1315	
DTW	13.29	13.29	13.29	
TEMP	7.78	7.77	7.88	
COND	0.098	0.097	0.097	
DO	6.32	6.26	6.21	
PH	5.29	5.29	5.27	
ORP	410.8	416.6	422.5	
TURB.	1.93	0.14	0.45	
FLOW RATE	200	200	200	

SAMPLE ID - 1C-W-1-0411

TIME 1320

JOB TITLE \_\_\_\_\_  
JOB NO. \_\_\_\_\_ CALCULATION NO. \_\_\_\_\_  
ORIGINATOR \_\_\_\_\_ DATE \_\_\_\_\_  
REVIEWER \_\_\_\_\_ DATE \_\_\_\_\_  
SCALE \_\_\_\_\_ SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

0840 ARRIVE ON SITE - CHECK IN @ TRAILER (AECOM) & @ HCL BUILDING.  
ASSIST ERIC STRICKLAND @ HCL BUILDING -  
1040 BEGIN CALIBRATING EQUIPMENT & MOVE TO IC-W-7  
1105 BEGIN PURING IC-W-7





# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60191113  
Date 5/19/11

Well No. 1C-W-7  
Sampled By DWK  
weather Clear, 50 °F

WELL INFORMATION	
Depth to water	10.45 (ft)
Depth of well:	(ft)
Well diameter:	(in)
Feet of water:	(ft)
Product thickness:	(ft)
Screen interval:	
well condition:	

COMMENTS
Tubing in/let at ~11.25'

PURGE DATA							
start purge time	1214						
time		1224	1227	1230	1233		
DTW	(ft)	10.45					
purge rate	(L/min)	0.30					
pH	(Units)	5.11	5.17	5.18	5.20		
conductivity	(umhos/cm)	0.078	0.078	0.079	0.079		
temperature	(deg C)	10.4	10.4	10.4	10.4		
D.O.	(mg/L)	2.42	2.41	2.35	2.33		
ORP	(mv)	288	285	285	284		
turbidity	(NTU)	1.62	1.17	1.10	1.06		
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
1C-W-7-051	1235	NWTPH-Dx	1L Gl. Amber	2	HCl
1C-W-70-0511 (duplicate)	1245	"	"	"	"





# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: <b>BNSF</b>	Report To: <b>Tanner Wald</b>	Attention: <b>Bruce Sheppard</b>	Page: <u>1</u> of <u>1</u>		
Address:	Copy To: <b>Renee Kaecht</b>	Company Name: <b>BNSF</b>	1469801		
Email To:	Purchase Order No.: <b>TT0100-K40</b>	Address:	REGULATORY AGENCY		
Phone:	Project Name: <b>BNSF-Skykomish</b>	Pace Quote Reference:	<input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER		
Requested Due Date/TAT: <b>Std</b>	Project Number: <b>60191113</b>	Manager:	Site Location: <b>WA</b>	STATE: <b>WA</b>	

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test ↑	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
				COMPOSITE START	COMPOSITE END/GRAB						
1	15-W-1 + 0511	Drinking Water	WT	DATE	TIME	DATE	TIME	Unpreserved	Analysis Test ↑		
2	1-1-8-	Water		5/19/11	1050	5/19/11	1050	HCl			
3	1-1-8-	Waste Water			1125		1125	NaOH			
4	1-1-8-	Product			1735		1735	HNO <sub>3</sub>			
5	1-1-8-	Soil/Solid			1745		1745	H <sub>2</sub> SO <sub>4</sub>			
6		Oil						Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>			
7		Wipe						Other			
8		Air									
9		Tissue									
10		Other									
11											
12											

<b>ADDITIONAL COMMENTS</b>		<b>RELINQUISHED BY / AFFILIATION</b>	<b>DATE</b>	<b>TIME</b>	<b>ACCEPTED BY / AFFILIATION</b>	<b>DATE</b>	<b>TIME</b>	<b>Temp in °C</b>	<b>Received on</b>	<b>Custody</b>	<b>Samples Intact</b>
w/ Seal - without Slicab gel		Seal 2/2/11 - (BNSF)	5/19/11	15:15	Seal 2/2/11 - (BNSF)	5/19/11	15:15				
Cleanup											

## AECOM ENVIRONMENT

## FIELD ACTIVITY LOG

PROJECT BNSF - Skykomish COMPLETED BY D. Kinney  
 JOB NO. 60191113 APPROVED BY \_\_\_\_\_  
 DAY & DATE Tues. June 21<sup>st</sup>, 2011 SHEET 1 OF 1

## FIELD ACTIVITY SUBJECT:

## DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

GW Sampling &amp; Sampling

TIME	
0745	Arrived onsite & setup to sample, unboxed sensors
0815	Fred & Ghani arrive onsite, did H&S mtg
0830	Finishing setting up van
0850	Went to start sampling
1040	Finished sampling & went to find Fred & Ghani
1055	Calibrated meters - HI (model 556) & Oyster (model F100)
1120	Went to lunch
1150	Returned from lunch & setup on 2B-W-4
1204	Started purging 2B-W-4
1225	Sampled 2B-W-4 for NWT PH-DX
1301	Started purging GW-1
1320	Sampled GW-1 for NWT PH-DX
1347	Started purging 5-W-43 →
1405	Sampled 5-W-43 for NWT PH-DX
1424	Started purging GW-2
1445	Sampled GW-2 for NWT PH-DX
1521	Started purging GW-3
1545	Sampled GW-3 for NWT PH-DX
1613	Started purging 2A-W-41
1630	Sampled 2A-W-41 for NWT PH-DX
1645	Pumped purge water & put away equip.
1800	Left site

## VISITORS ON SITE:

None

## CHANGES FROM PLANS OR IMPORTANT DECISIONS:

None

## WEATHER CONDITIONS:

Clear, 65-70°F

## IMPORTANT TELEPHONE CALLS:

None

## PERSONNEL ON SITE:

Dean Kinney, Fred Merrill &amp; Ghani Sebbane



## AECOM ENVIRONMENT

## FIELD ACTIVITY LOG

PROJECT BNSF-SkykomishCOMPLETED BY D. KinneyJOB NO. 60191113

APPROVED BY \_\_\_\_\_

DAY & DATE Weds. June 22<sup>nd</sup> 2011SHEET 1 OF 2

## FIELD ACTIVITY SUBJECT:

## DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

GW Sampling

TIME	
0735	Arrived on site & setup to sample
0800	Safety mtg
0830	Started air monitoring canister in Joseph house crawl space
0835	Calibrating KSI (model 558) & Oyster (model T-102) meters
0859	Started purging 5-W-14
0920	sampled 5-W-14 for NWTPH-DX
0942	Started purging 5-W-17
1000	sampled 5-W-17 for NWTPH-DX
1016	Started purging 5-W-15
1035	sampled 5-W-15 for NWTPH-DX; took duplicate - 5-W-15-DX11
1215	Started purging 5-W-18 after dumping purge water @ hauling lunch
1235	sampled 5-W-18 for NWTPH-DX
1251	Started purging 5-W-18
1315	sampled 5-W-18 for NWTPH-DX; took sample volume for lab QC
1332	Started purging 5-W-16
1350	sampled 5-W-16 for NWTPH-DX
1410	Went to dump purge water get another cooler
1443	Started purging 2A-W-9
1505	sampled 2A-W-9 for NWTPH-DX
VISITORS ON SITE:	
None	
CHANGES FROM PLANS OR IMPORTANT DECISIONS:	
None	
WEATHER CONDITIONS:	
P. Cloudy, 55 - 70 °F	
IMPORTANT TELEPHONE CALLS:	
None	
PERSONNEL ON SITE:	
Dean Kinney, Ghani Sebbane	

## FIELD ACTIVITY LOG

COMPLETED BY D. C. Jones  
APPROVED BY \_\_\_\_\_  
SHEET 2 OF 2

**DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:**

## GW Sampling

AECOM Field Forms – 2009

## Field Activity Log

Page: 1 of 1

AECOM

Project Name: BNSF Sky

Completed By: Ghani Soltan

Project Number:

Date: 06/21/11

Field Activity: Quarterly GW

Weather: Sunny clear 72°F

Sampling

Personnel on site: Ghani, Fred, Dean

0810: Arrived to the site, had safety meeting, put on PPE, organized equipment in van.

0850: Started gauging product wells.

0930: Began gauging clean wells.

1145: Had lunch.

1230: Started surveying sky river on 5 point station.  
SK4-5.

1415: Began setting up on 2 AW-42.

1454: Started purging water is clear.

1504: Began recording parameters. turbidity unstable.

1535: Started sampling.

1555: Started setting up on GW-4

1601: Began purging, water is clear.

1611: Started recording parameters.

1620: Began collecting samples.

1645: Started setting up on 2AEW-2A.

1650: Began purging.

1700: Started recording parameters.

1710: Began sampling.

1730: Disposed purge water into drain in HCC building.

1740: Organized equipment and Fred coolers with Dean.

1815: Left site.

~~Abdelfattah Soltan~~



## Field Activity Log

Page: 1 of 2 **AECOM**

Project Name: BMSF Sky

Completed By: Ghani & Gan

Project Number:

Date: 06/22/11

Field Activity: Quarterly GW

Weather: sunny 70's

Sampling

Personnel on site: Ghani, S.; Dean, K.

0740: Arrived to the site. Signed in and had safety meeting with Dean.

0815: organized equipment, calibrated YSI and turbidity meter.

0835: started setting up on IC-W-1.

0855: Began purging, water is clear.

0905: started recording parameters.

0915: Began sampling.

0925: Started setting up on IC-W-8.

0936: Began purging. water is clear.

0946: started collecting parameters.

0955: Began sampling.

1015: started setting up on IC-W-7.

1028: Began purging water is clear.

1033: started recording parameters.

1050: Began sampling.

1115: started setting up on IB-W-23.

1130: Began purging. water is slightly cloudy.

1140: started recording parameters. turbidity unstable.

1200: Began sampling.

1230: ~~disposed~~ Took lunch.

1315: Disposed purge water into down in the building.

1325: started setting up on 2AW-400.

1340: Began purging. water is clear.

1350: started recording parameters.

1400: Began sampling. also collected Dup 2AW-400 @ 1430.

## Field Activity Log

Page: 2 of 2

AECOM

Project Name: BNSF Sky.

Completed By: Ghani Sebame

Project Number:

Date: 06/22/11

Field Activity: Quarterly GW  
Sampling.

Weather: overcast 68°F.

Personnel on site: Ghani, Dean, K.

1430: started setting up on BW-1.

1438: Began purging, water is clear.

1448: started recording parameter Do unstable.

1505: Began sampling.

1530: Started setting up on MW-4.

1539: Began purging, water is clear.

1549: Started recording parameters.

1600: Began sampling.

1620: Disposed purge water into drum. I pumped out  
a purge water from Drum into Hec tank.

1635: started organizing equipment into my van, and  
we stucked coolers into Dean's van.

1730: left a site.

Abed Ghani Sebame

CHAIN-OF-CUSTODY / Analytical Request Document  
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information: Section B Required Project Information: Section C Invoice Information: Page: 1 of 3

Company: BNSF Report To: Jennifer Wald Copy To: Renee Knecht  
Address: Purchase Order No.: 70100-1540  
Email To: Project Name: BNSF-SKYKOMISH  
Phone: Fax: Project Number: 60191113  
Requested Due Date/TAT: STD  
Attention: Bruce Shepard  
Company Name: BNSF  
Address: Pace Quote Reference: Pace Project Manager: Pace Profile #:  
REGULATORY AGENCY: NPDES ☒ GROUND WATER ☐ DRINKING WATER ☐  
UST ☐ RCRA ☐ OTHER ☐  
Site Location STATE: WA

ITEM #	Section D Required Client Information Matrix Codes MATRIX / CODE Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Tissue TS Other OT	Matrix Code (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analysis Test	Requested Analysis Filtered (Y/N)						Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
				COMPOSITE START	COMPOSITE END/GRAB			H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other								
1	2B-W-4	0611				6/1/11 1225	10 2								X							
2	GW-1					1320	10 2								X							
3	5-W-43					1405	9 2								X							
4	GW-2					1445	9 2								X							
5	GW-3					1545	10 2								X							
6	2A-W-41					1630	10 2								X							
7	2A-W-42					1535	12 2								X							
8	GW-4					1620	10 2								X							
9	EW-2A					1710	9 2								X							
10	1C-W-1					1710	9 2								X							
11	1C-W-7					1821	0915	10 2							X							
12	1C-W-8					1850	11 2								X							

ADDITIONAL COMMENTS: W0566U without silica 9/23/11 0745 Bulk Pace 9/23/11 0745  
RELINQUISHED BY / AFFILIATION: AECOM 9/23/11 DATE: 9/23/11 TIME: 0745  
ACCEPTED BY / AFFILIATION: Bulk Pace 9/23/11 0745  
SAMPLER NAME AND SIGNATURE: Dean W. Kinney  
PRINT Name of SAMPLER: Dean W. Kinney  
SIGNATURE of SAMPLER: [Signature]  
DATE Signed (MM/DD/YY): 6/23/11  
Temp in °C: Received on Ice (Y/N): Custody Sealed Cooler (Y/N): Samples Intact (Y/N):



The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

1470742

**Pace Project No./ Lab I.D.**

**CHAIN-OF-CUSTODY / Analytical Request Document**  
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

**Section A**

Required Client Information:

Company: BNSF  
Address: \_\_\_\_\_  
Email To: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
Requested Due Date/TAT: STD

**Section B**

Required Project Information:

Report To: Janitor held  
Copy To: Renae Knecht  
Purchase Order No.: TT0100-K40  
Project Name: BNSF-SKYKOMISH  
Project Number: 60191113

**Section C**

Invoice Information:

Attention: Bruce Sheppard  
Company Name: BNSF  
Address: \_\_\_\_\_  
Pace Quote Reference: \_\_\_\_\_  
Pace Project Manager: \_\_\_\_\_  
Pace Profile #: \_\_\_\_\_

Page: 3 of 3

**1338906**

**REGULATORY AGENCY**

☒ NPDES ☒ GROUND WATER ☐ DRINKING WATER  
☐ UST ☐ RCRA ☐ OTHER \_\_\_\_\_

Site Location STATE: WA

**Section D**  
Required Client Information

**SAMPLE ID**  
(A-Z, 0-9 / -)  
Sample IDs MUST BE UNIQUE

Matrix Codes  
MATRIX / CODE

- Drinking Water DW  
Water WT  
Waste Water WW  
Product P  
Soil/Solid SL  
Oil OL  
Wipe WP  
Air AR  
Tissue TS  
Other OT

ITEM #

MATRIX CODE (see valid codes to left)  
SAMPLE TYPE (G=GRAB C=COMP)

DATE	TIME	DATE	TIME	COLLECTED	
				COMPOSITE START	COMPOSITE END/GRAB
6/21/11	1430	15	2		
6/21/11	1505	11	2		
6/21/11	1600	16	2		
6/21/11	1600	11	2		

SAMPLE TEMP AT COLLECTION

# OF CONTAINERS

Unpreserved  
H<sub>2</sub>SO<sub>4</sub>  
HNO<sub>3</sub>  
HCl  
NaOH  
Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>  
Methanol  
Other

Analysis Test ↓

Requested Analysis Filtered (Y/N)

Residual Chlorine (Y/N)

Pace Project No./ Lab I.D.

**ADDITIONAL COMMENTS**

RELINQUISHED BY / AFFILIATION

DATE

TIME

ACCEPTED BY / AFFILIATION

DATE

TIME

SAMPLE CONDITIONS

**SAMPLER NAME AND SIGNATURE**

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY):

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)



## Fluid Level Gauging Form

Project Name: BNSF Skykomish

Project Number: 60191113

Collected by:

D. Kinney, F. Merrill, G. Solbane

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	3/21/2011		12/14/2010		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
1A-W-36	6/2/11	—	—	NM	—	—	—	NM		NM		—	Not installed
1A-W-37	—	—	—	NM	—	—	—	NM		NM		—	Not installed
1A-W-38	—	—	—	NM	—	—	—	NM		NM		—	Not installed
1B-W-23	—	10:35	NM	16.21	None	None	WL	16.22		14.29		GS/FM	Not installed
1B-W-24	—	—	—	NM	—	—	—	NM		NM		—	Not installed
1C-W-1	—	10:59	NM	12.63	None	None	WL	13.02		10.98		GS/FM	Not installed
1C-W-7	—	11:04	—	12.04	—	—	—	10.75		8.70		—	
1C-W-8	—	11:09	—	10.51	—	—	—	12.31		10.29		—	
2A-W-5	—	09:42	—	12.23	—	—	—	11.94		9.74		DW/K	
2A-W-7	—	09:59	—	10.36	—	—	—	11.01		8.63		—	
2A-W-8	—	08:52	—	13.55	—	—	—	14.13		10.37		—	
2A-W-9	—	09:15	—	10.02	—	—	—	9.78		7.75		—	
2A-W-10	—	09:19	—	9.49	—	—	—	9.47		7.64		—	
2A-W-40	—	10:21	—	11.18	—	—	—	11.84		9.48		GS/FM	
2A-W-41	—	10:24	—	15.46	—	—	—	16.31		13.54		—	
2A-W-42	—	10:28	—	11.87	—	—	—	11.88		9.70		—	
2B-W-4	—	09:39	—	1.97	—	—	—	2.25		0.32		DW/K	
5-W-14	—	09:55	—	7.95	—	—	—	9.19		6.49		GS/FM	
5-W-15	—	09:48	—	6.49	—	—	—	7.67		6.18		—	
5-W-16	—	09:41	—	6.73	—	—	—	8.00		5.53		—	
5-W-17	—	10:49	—	6.11	—	—	—	7.36		4.84		—	
5-W-18	—	09:49	—	6.19	—	—	—	7.47		5.04		—	
5-W-19	—	09:46	—	6.04	—	—	—	7.36		5.98		—	
5-W-20	—	—	—	NM	—	—	—	6.90		4.57		—	Well abandoned
5-W-42	—	—	—	NM	—	—	—	6.56		4.62		—	Well abandoned
5-W-43	—	10:01	NM	6.19	None	None	WL	6.96		4.42		GS/FM	
5-W-44	—	—	—	NM	—	—	—	NM		NM		—	Not installed

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	3/21/2011		12/14/2010		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
MW-1	4/21/11	0949	NM	11.34	NM	NM	WL	11.85		9.11		DWK	
MW-2		0929		10.69				11.35		7.99			
MW-3		0925		7.85				7.80		5.83			
MW-4		0920		7.82				7.84		6.18			
MW-5		0912		6.85				6.54		4.52			
MW-9		1012		12.14				11.75		9.46			
MW-10		1009		11.52				11.32		11.44			
MW-11		1005		11.98				12.00		9.75			
MW-12R				NM				NM		NM			Not Installed
MW-13		0903	NM	9.28	NM	NM	WL	9.01		6.96		DWK	
MW-14		0900	13.81	11.29				10.96		8.92			
MW-15		0906		12.54				12.09		10.02			
MW-16		1014		12.39				12.81		10.67			
MW-18		0945		13.40				13.35		10.91			
MW-38R		1119		4.04				4.43		2.42			GS/AM
MW-40		0909		12.07				11.59		9.51			GS/AM
2B-W-47				NM				NM		NM			Not Installed
2B-W-48				NM				NM		NM			Not Installed
EW-1		1009	NM	8.96	NM	NM	WL	9.01		6.45		GS/AM	
EW-2A		1055		9.05				NM		NM			
GW-1		1004		8.19				9.05		6.18			
GW-2		1014		10.69				11.55		8.68			
GW-3		1031		15.31				16.38		13.89			
GW-4		1049		9.11				9.35		7.03			



CS/EN

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	3/21/2011		12/14/2010		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
PZ-1R	06/21							NM		10.20			
PZ-2N								NM		11.63			
PZ-2S								NM		9.83			
PZ-3N								NM		13.97			
PZ-3S								NM		10.38			
PZ-4N								NM		14.64			
PZ-4S								NM		11.79			
PZ-5N								NM		10.24			
PZ-5S				9.07		Hvy TR	TP	NM	Hvy TR	9.93	Hvy TR	CS/EN	10 - 0.73
PZ-6N								NM		13.29			
PZ-6S				2.82		Hvy TR	TP	NM	Hvy TR	8.53	Hvy TR	CS/EN	10 - .89 - 1.29
PZ-7N								NM		12.40			
PZ-7S								NM		9.08			
PZ-8								NM		10.20			
2A-W-3		04/05		10.01		Hvy TR	TP	9.87	Trace	7.40	0.10	CS/EN	11 - 0.99
MM-7		08/55		12.19		NONE	TP	11.73	None	9.42	None	"	13 - 0.82
MM-28				NM				13.11	None	10.22	None		
2A-W-4		09/13		10.27		TR	TP	9.61	Hvy TR	7.52	None	CS/EN	11 - 0.83

Other Notes:

☒ dirty casing, possible trace product  
☐ dirty well

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

From PVC

# River Gauging Form

Project Name: **BNSF Skykomish**

Project Number: **60191113**

Measured by: **F. Mazzilli / G. Gagnier**

stake ID	date	time	backsight	foresight	water level	comments
SK-1	6/21/11	12:40	10.55	17.60		7.05 S-W-15 back sight
SK-2	6/21/11	12:46	10.55	16.05		S-W-15 "
SK-3	6/21/11	12:53	10.55	15.38		S-W-15 "
SK-4	6/21/11	13:00	4.29	19.45		18-W-3 "
SK-5	6/21/11	13:15	4.52	14.84		EW-24 "
ML-1						
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

GN-4 = 6.09

GN-24 = 4.54

S-W-15 - backsight 10.55



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60191113  
Date 6/27/11

Well No. 5-W-15  
Sampled By DWK  
weather P. Cloudy, 60 °F

WELL INFORMATION	
Depth to water	5.21 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	none (ft)
Screen interval:	
well condition:	ok

COMMENTS
Tubing inlet at ~ 7.0' below TOC

PURGE DATA							
start purge time	1016						
time		1028	1031	1034			
DTW	(ft)	6.25					
purge rate	(L/min)	0.30					
pH	(Units)	6.26	6.29	6.30			
conductivity	(umhos/cm)	0.177	0.178	0.179			
temperature	(deg C)	10.2	10.3	10.3			
D.O.	(mg/L)	1.12	1.12	1.12			
ORP	(mv)	159	156	152			
turbidity	(NTU)	4.02	3.96	3.77			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
5-W-15-0611	1035	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl
5-W-15D-0611	1050	"	"	"	"
(duplicate)		"	"	"	"







# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
 Project No. 60191113  
 Date 6/22/11

Well No. 5-W-18  
 Sampled By DWK  
 weather Partly cloudy, 65°F

WELL INFORMATION	
Depth to water	5.92 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	none (ft)
Screen interval:	
well condition:	OK

COMMENTS
Tubing hole at ~6.5' below TDC
Extra sample for ms/MSD

## PURGE DATA

start purge time	1251						
time		1301	1304	1307	1310		
DTW	(ft)	5.92					
purge rate	(L/min)	0.30					
pH	(Units)	6.41	6.47	6.49	6.50		
conductivity	(umhos/cm)	0.143	0.145	0.147	0.148		
temperature	(deg C)	10.2	10.3	10.2	10.3		
D.O.	(mg/L)	1.39	1.11	1.06	1.01		
ORP	(mv)	-4.1	-4.9	-5.3	-5.1		
turbidity	(NTU)	0.57	0.55	0.51	0.46		
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
5-W-18-0611	1315	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl



# GROUNDWATER SAMPLING LOG

Date \_\_\_\_\_

weather

WELL INFORMATION		
Depth to water	5,760	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	none	(ft)
Screen interval:		
well condition:	OK	

[illegible]

PURGE DATA							
start purge time	1215						
time		1225	1228	1231	1234		
DTW	(ft)	5.76					
purge rate	(L/min)	0.30					
pH	(Units)	6.19	6.22	6.15	6.17		
conductivity	(umhos/cm)	0.043	0.043	0.043	0.044		
temperature	(deg C)	9.1	9.0	9.0	9.0		
D.O.	(mg/L)	7.62	7.64	7.54	7.50		
ORP	(mv)	-12	-9	30	31		
turbidity	(NTU)	0.10	0.10	0.11	0.10		
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

[illegible]







# GROUNDWATER SAMPLING LOG

6/22/11

MW-4

weather overcast 68 °F

WELL INFORMATION		
Depth to water	7.68	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	NA	(ft)
Screen interval:		
well condition:	Good.	

[illegible]

PURGE DATA							
start purge time	1539						
time		1549	1552	1555			
DTW	(ft)	7.73	7.74	7.74			
purge rate	(L/min)	250	250	250			
pH	(Units)	5.84	5.82	5.83			
conductivity	(umhos/cm)	0.057	0.057	0.057			
temperature	(deg C)	11.20	11.06	10.98			
D.O.	(mg/L)	0.85	0.79	0.78			
ORP	(mv)	147.3	142.3	137.7			
turbidity	(NTU)	0.55	0.63	0.54			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

[illegible]



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60191113  
Date 6/22/11

Well No. 2A-W-10  
Sampled By DWK  
weather P. Cloudy, 70 °F

WELL INFORMATION	
Depth to water	9.39 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	none (ft)
Screen interval:	
well condition:	ok

COMMENTS
Tabling Inlet at ~ 10.0' below TOC

PURGE DATA							
start purge time	1508						
time		1518	1521	1524			
DTW	(ft)	9.52					
purge rate	(L/min)	0.30					
pH	(Units)	5.22	5.23	5.2			
conductivity	(umhos/cm)	0.076	0.074	0.07			
temperature	(deg C)	9.8	9.8	9.8			
D.O.	(mg/L)	0.99	0.97	0.94			
ORP	(mv)	99	98	98			
turbidity	(NTU)	1.17	1.10	1.07			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
2A-W-10-0611	1525	NWTPH-Dx	1L Gl. Amber	2	HCl
2A-W-102-0611	1540	"	"	"	"
(Duplicate)					



## GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
 Project No. 60191113  
 Date 6/24/11

Well No. 2A-W-4D  
 Sampled By G. L. Gibson  
 weather overcast 68°F

### WELL INFORMATION

Depth to water 10.99 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: NA (ft)  
 Screen interval:  
 well condition: no beds

### COMMENTS

inlet tubing ~ 12 ft.

### PURGE DATA

start purge time	1340						
time		1350	1353	1356			
DTW	(ft)	11.00	11.00	11.00			
purge rate	(L/min)	250	250	250			
pH	(Units)	6.37	6.37	6.37			
conductivity	(umhos/cm)	0.046	0.044	0.044			
temperature	(deg C)	14.35	14.33	14.32			
D.O.	(mg/L)	7.61	7.90	7.87			
ORP	(mv)	108.3	108.5	109.5			
turbidity	(NTU)	0.58	0.67	0.60			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

### SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
2A-W-4D-0611	1400	NWTPH-Dx	1L Gl. Amber	2	HCl
2A-W-4D-0611	1430	NWTPH-Dx	1L Gl. Amber	2	HCl
(duplicate)					

# GROUNDWATER SAMPLING LOG

Date 6/21/11

weather clear, 70 °F

WELL INFORMATION		
Depth to water	15.46	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	none	(ft)
Screen interval:		
well condition:	ok	

**COMMENTS**

Tubing Inlet at ~ 16.75" below  
TDC

PURGE DATA							
start purge time	1613						
time		1623	1626	1629			
DTW	(ft)	15.49					
purge rate	(L/min)	0.30					
pH	(Units)	5.89	5.91	5.93			
conductivity	(umhos/cm)	0.040	0.041	0.040			
temperature	(deg C)	10.0	10.0	10.0			
D.O.	(mg/L)	7.13	7.12	7.11			
ORP	(mv)	447	448	445			
turbidity	(NTU)	1.29	1.20	1.27			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

[illegible]





# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No.	60191113
-------------	----------

Date 08/20/11

Well No. 2A-W-42

Sampled By E. J. J. J.

weather Sunny °F

## WELL INFORMATION

Depth to water 11.87 (ft)

Depth of well: \_\_\_\_\_ (ft)

Well diameter: 7 (in)

Feet of water: \_\_\_\_\_ (ft)

Product thickness: 11 A (ft)

Screen interval: \_\_\_\_\_

well condition: Good.

## COMMENTS

## PURGE DATA

start purge time	1454
------------------	------

time		1528	1531	1534
------	--	------	------	------

DTW	(ft)	11.87	11.87	11.87
-----	------	-------	-------	-------

purge rate	(L/min)	250	250	250
------------	---------	-----	-----	-----

pH	(Units)	6.15	6.15	6.15
----	---------	------	------	------

conductivity	(umhos/cm)	0.085	0.085	0.085
--------------	------------	-------	-------	-------

temperature	(deg C)	12.62	12.51	12.60
-------------	---------	-------	-------	-------

D.O.	(mg/L)	1.61	1.62	1.54
------	--------	------	------	------

ORP	(mv)	115.7	114.1	112.9
-----	------	-------	-------	-------

turbidity	(NTU)	1.49	1.25	1.25
-----------	-------	------	------	------

purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing
-------------------------	---

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
---------------	------	----------	-----------	-----------	--------------

2A-W-42-0611535	NWTPH-Dx	1L Gl. Amber	2	HC
-----------------	----------	--------------	---	----

# GROUNDWATER SAMPLING LOG

Date 06/22/11

weather Overcast 70 °F

WELL INFORMATION		
Depth to water	16.06	(ft)
Depth of well:	20.50	(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	NA	(ft)
Screen interval:		
well condition:	Good	

COMMENTS	
inlet tubing	17.10 F1
turbidity unstable	

PURGE DATA								
start purge time	1130							
time		1140	1143	1146	1149	1152	1155	1157
DTW	(ft)	16.10	16.11	16.11	16.11	16.11	16.11	16.11
purge rate	(L/min)	150	150	150	150	150	150	150
pH	(Units)	6.36	6.29	6.25	6.21	6.17	6.16	6.13
conductivity	(umhos/cm)	0.093	0.084	0.080	0.078	0.076	0.074	0.071
temperature	(deg C)	10.81	10.05	11.01	10.54	10.62	10.82	10.47
D.O.	(mg/L)	7.40	6.71	6.52	6.44	6.21	6.15	6.10
ORP	(mv)	114.7	113.7	114.6	112.1	113.3	113.8	115.4
turbidity	(NTU)	5.28	4.90	3.37	2.94	2.54	2.52	2.47
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

[illegible]





















# GROUNDWATER SAMPLING LOG

Project name	BNSF-Skykomish
Project No.	60191113
Date	6/24/11

Well No. GW-2  
Sampled By DWK  
weather clear 70 °F

WELL INFORMATION	
Depth to water	10.68 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	none (ft)
Screen interval:	
well condition:	ok

[illegible]

PURGE DATA							
start purge time		1424					
time		1434	1437	1440			
DTW	(ft)	10.69					
purge rate	(L/min)	6.30					
pH	(Units)	5.49	5.51	5.51			
conductivity	(umhos/cm)	0.078	0.078	0.078			
temperature	(deg C)	8.7	8.7	8.8			
D.O.	(mg/L)	1.05	1.05	1.03			
ORP	(mv)	242	241	240			
turbidity	(NTU)	0.86	0.81	0.77			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

[illegible][illegible]









# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: <b>AECOM</b>	Report To: <b>Mark H. A. Hughes</b>	Attention:	Page: <b>1</b> of <b>1</b>		
Address: <b>710 2nd Ave.</b>	Copy To: <b>Renee K. Brown</b>	Company Name:	1470960		
<b>Sw. 1000. 8th Ave. WA 98101</b>	Purchase Order No.: <b>60191115-0540</b>	Address:	REGULATORY AGENCY		
Email To: <b>Mark.Hughes@pacelabs.com</b>	Project Name: <b>BNMF SKYKOMM</b>	Pace Quote Reference:	<input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER		
Phone: <b>206-624-9341</b>	Project Number: <b>60191115-0540</b>	Pace Project Manager:	<input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER		
Requested Due Date/TAT:		Pace Profile #:	Site Location: <b>SKYKOMM</b>		
			STATE: <b>WA</b>		

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test ↓	Requested Analysis Filtered (Y/N)	Pace Project No./ Lab I.D.
				COMPOSITE START	COMPOSITE END/GRAB						
1	1C-W-1-0711	DW Drinking Water		DATE: 07/28/11 1340	TIME: 1340		2	Unpreserved	Analysis Test	Y	
2	1C-W-7-0711	WT Water		DATE: 07/28/11 1135	TIME: 1135		2	HCl	Analysis Test	Y	
3	1C-W-8-0711	WW Waste Water		DATE: 07/28/11 1240	TIME: 1240		2	HNO <sub>3</sub>	Analysis Test	Y	
4	1C-W-20-0711	P Product		DATE: 07/28/11 1300	TIME: 1300		2	NaOH	Analysis Test	Y	
5		SL Soil/Solid						Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Analysis Test		
6		OL Oil						HCl	Analysis Test		
7		WP Wipe						HNO <sub>3</sub>	Analysis Test		
8		AR Air						H <sub>2</sub> SO <sub>4</sub>	Analysis Test		
9		TS Tissue						Unpreserved	Analysis Test		
10		Other						Other	Analysis Test		
11											
12											
ADDITIONAL COMMENTS											
RELINQUISHED BY / AFFILIATION											
DATE											
TIME											
ACCEPTED BY / AFFILIATION											
DATE											
TIME											
SAMPLE CONDITIONS											
Received on											
Ice (Y/N)											
Custody											
Sealed Cooler (Y/N)											
Samples Intact (Y/N)											

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER: <b>Abdullgani Silaban</b>	DATE Signed (MM/DD/YYYY): <b>07/28/11</b>
SIGNATURE of SAMPLER: <b>Abdullgani Silaban</b>	

\*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

**AECOM**

Well ID: IC-W-1  
Sample ID: IC-W-1-0711  
Well Condition: Good

Initial Depth to Water\* (ft): 13.22  
Depth to Product\* (ft):  
Product Thickness (ft):  
Water Column (ft): 3.48  
Inner Casing Diameter (Inch): 2  
Water Volume in Well (gal): 0.57  
Inner Casing Material: PVC  
Start Purge Time: 1319  
**PURGING INFORMATION**

Purge/Sample Method:	low-flow
Purge/Sample Equipment	Peristaltic Pump
Screened Interval Depth Range* (ft)	10 - 16.70
Tubing Inlet Depth* (ft):	≈ 14.50 ft
Total Well Depth* (feet):	16.70
sampling tube material	polyethylene, silicone

[illegible]

Sample ID	sample time	Analysis	Method	Container	No. of bottles	Preservative
1C-W-1-07H	1340	NWTPH-Dx w/o SGCU		1L Gl. Amber	2	HCL

Dissolved Oxygen: +/- 10%  
Conductivity: +/- 10%  
Temperature: +/- 10 %  
pH: +/- 0.1 unit  
Redox Potential: +/- 10%  
Turbidity: +/- 10%

purge water is clear  
turbidity read 0.00. used 6 mm cuvette.

\* = Measured from top of inner casing  
DTW - Depth to Water  
Initial purge 15 minutes, then measure at 3 minute intervals  
Water Levels Measured with an Electronic Water Level Meter  
Field parameter meter calibration results are recorded in the field book.

2" casing: 1 ft = 0.164 gal = 0.62 L  
4" casing: 1 ft = 0.656 gal = 2.48 L  
1 gal = 3785.4 mL

**AECOM**

Well ID: 1C-W-7  
Sample ID: 1C-W-7-0711  
Well Condition: Good.

Purge/Sample Method:	low-flow
Purge/Sample Equipment	Peristaltic Pump
Screened Interval Depth Range* (ft)	10 - 20.80
Tubing Inlet Depth* (ft):	13 FT.
Total Well Depth* (feet):	20.80
sampling tube material	polyethylene, silicone

## SAMPLING INFORMATION

## STABILIZATION RANGES

Dissolved Oxygen: +/- 10%  
Conductivity: +/- 10%  
Temperature: +/- 10 %  
pH: +/- 0.1 unit  
Redox Potential: +/- 10%  
Turbidity: +/- 10%

\* = Measured from top of inner casing

DTW - Depth to Water

Initial purge 15 minutes, then measure at 3 minute intervals

### Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

**COMMENTS & OBSERVATIONS:** ( slow recharge, turbidity, odor, sheen, PID readings)

purge water is clear.

Turbidity couldn't read properly  
due to turbidity meter malfunction.

2" casing: 1 ft = 0.164 gal = 0.62 L

4" casing: 1 ft = 0.656 gal = 2.48 L

1 gal = 3785.4 mL



**AECOM**

Well ID: 1C-W-8  
Sample ID: 1C-W-8-0711  
Well Condition: Good

Purge/Sample Method:	low-flow
Purge/Sample Equipment	Peristaltic Pump
Screened Interval Depth Range* (ft)	10 - 18 - 20
Tubing Inlet Depth* (ft):	~ 14 ft
Total Well Depth* (feet):	18.20
sampling tube material	polyethylene, silicone

7/27/2011 Page 1 of 1

## Field Activity Log

Page: 1 of 1

**AECOM**

Project Name: BNSF SkyKorish	Completed By: Ghani, Sebbane
Project Number: 60191113-0540	Date: 07/28/11
Field Activity: Monthly GW Sampling	Weather: Sunny 70°F
	Personnel on site: Ghani, Sebbane

0910: Arrived to the site, signed in at AECOM Trailer office and AT Strider office.

0930: started setting up canister air sampling. Serial # FCO428. calibration date: 07/20/11

0935: started air sampling. vacuum gauge dropped to -29.06

0950: picked up bottle samples, tubing, buckets

1015: There were construction going on in the house.

painting garage. I have to start sampling IC-W-7. which was put up. waiting to put concrete around it.

1030: started setting up on IC-W-7. Turbidity meter doesn't work. read 0.00.

1045: I went to HCC building to get an other meter.

1100: started setting up again on IC-W-7.

1115: began purging

1125: started recording parameters. Turbidity is 0.00. ~~meter~~

1135: started sampling.

1205: Began setting up on IC-W-8.

1219: started sampling & purging water is clear.

1229: Began recording parameters.

1240: started sampling, also collected duplicate IC-W-80-0711 at 1300.

1305: started setting up on IC-W-1. I used battery pack to operate a pump.

1319: started purging.

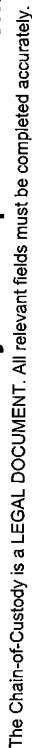
1329: Began recording parameters.

1340: started sampling.

1405: Disposed purge water into HCC building drum, filled out Air canister coc.

1500: left as is

Abdellhamid Sebbane



The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

[illegible]

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**AECOM**

Well ID: 1C-W-1  
Sample ID: 1C-W-1-0811  
Well Condition: Good

Initial Depth to Water\* (ft): 13.71  
Depth to Product\* (ft): =  
Product Thickness (ft): =  
Water Column (ft): 2.99  
Inner Casing Diameter (Inch): 2  
Water Volume in Well (gal): 0.49  
Inner Casing Material: PVC  
Start Purge Time: 12.21  
SURCH PRODUCTION

Purge/Sample Method:	low-flow
Purge/Sample Equipment	Peristaltic Pump
Screened Interval Depth Range* (ft)	10.76.70
Tubing Inlet Depth* (ft):	15
Total Well Depth* (feet):	16.76
sampling tube material	polyethylene, silicone

[illegible]

Sample ID	sample time	Analysis	Method	Container	No. of bottles	Preservative
1C-W-1-0811	1245	NWTPH-Dx w/o SGCU		1L Gl. Amber	2	HCL

Dissolved Oxygen: +/- 10%  
Conductivity: +/- 10%  
Temperature: +/- 10 %  
pH: +/- 0.1 unit  
Redox Potential: +/- 10%  
Turbidity: +/- 10%

cond. Fluctuating From 51 to 383.

\* = Measured from top of inner casing

Field parameter meter calibration results are recorded in the field book.

$$1 \text{ gal} = 3785.4 \text{ mL}$$

Well ID: 1C-W-7.  
Sample ID: 1C-W-7-0811  
Well Condition: Good.

Initial Depth to Water\* (ft): 12.59  
 Depth to Product\* (ft): -  
 Product Thickness (ft): -  
 Water Column (ft): 8.41  
 Inner Casing Diameter (Inch): 2  
 Water Volume in Well (gal): 1.38  
 Inner Casing Material: PVC  
 Start Purge Time: 1408  
**PURGING INFORMATION**

Purge/Sample Method:	low-flow
Purge/Sample Equipment	Peristaltic Pump
Screened Interval Depth Range* (ft)	10 - 20.80
Tubing Inlet Depth* (ft):	13.50
Total Well Depth* (feet):	20.80
sampling tube material	polyethylene, silicone

[illegible]

Sample ID	sample time	Analysis	Method	Container	No. of bottles	Preservative
1C-W-7-0811	1425	NWTPH-Dx w/o SGCU		1L Gl. Amber	2	HCL

Dissolved Oxygen: +/- 10%  
Conductivity: +/- 10%  
Temperature: +/- 10 %  
pH: +/- 0.1 unit  
Redox Potential: +/- 10%  
Turbidity: +/- 10%

cond. unstable fluctuating from 0.036-0.125

\* = Measured from top of inner casing

DTW - Depth to Water

**Initial purge 15 minutes, then measure at 3 minute intervals**

#### Water Levels Measured with an Electronic Water Level Meter

Field parameter meter calibration results are recorded in the field book.

2" casing: 1 ft = 0.164 gal = 0.62 L

4" casing: 1 ft = 0.656 gal = 2.48 L

1 gal = 3785.4 mL

Well ID: 1C-W-8  
Sample ID: 1C-W-8-0811  
Well Condition: Good

Initial Depth to Water\* (ft): 13.12  
Depth to Product\* (ft): -  
Product Thickness (ft): 5.08  
Water Column (ft): 5.08  
Inner Casing Diameter (Inch): 0.83  
Water Volume in Well (gal):  
Inner Casing Material: PVC  
Start Purge Time: 1300

Purge/Sample Method:	low-flow
Purge/Sample Equipment	Peristaltic Pump
Screened Interval Depth Range* (ft)	10 - 18.20
Tubing Inlet Depth* (ft)	14.50
Total Well Depth* (feet):	18.20
sampling tube material	polyethylene, silicone

[illegible]

Sample ID	sample time	Analysis	Method	Container	No. of bottles	Preservative
1C-W-8-0811	1325	NWTPH-Dx w/o SGCU		1L Gl. Amber	2	HCL
1C-W-80-0811	1400	NWTPH-Dx w/SGCU		1L Amber	2	HCL

Dissolved Oxygen: +/- 10%  
Conductivity: +/- 10%  
Temperature: +/- 10 %  
pH: +/- 0.1 unit  
Redox Potential: +/- 10%  
Turbidity: +/- 10%

purge water is cleared after some bio-flock  
came out. Conductivity fluctuating. ran  
0.025-0.220

Field parameter meter calibration results are recorded in the field book.

1 gal = 3785.4 mL



## Field Activity Log

Page:    of

Project Name: SKYKOMISH

Completed By: Ghani Selbame

Project Number:

Date: 08/30/11

Field Activity: Monthly GW  
Sampling

Weather: Sunny 70°F

Personnel on site: Ghani's

1045: Arrived to the site put on PPE, signed in at AECOM office, met with Eric and Safety meeting.

1100: Put canister Air sampling in Justice Property -

1110: Bought 200; got bottles and tubing from banker House.

1135: started calibrating equipment YSI and turbidity meter.

1200: started setting up on IC-W-1

1221: Began purging, water is clear.

1231: Began recording parameters, cond. fluctuating between 51-383

1245: started sampling.

1300: Began purging, IC-W-8. water is clear.

1310: started recording parameters.

1325: Began sampling, also collected duplicate IC-W-80-@ 1400

1400: started setting up on IC-W-7.

1408: Began purging, water is clear.

1418: started recording parameters, cond. unstable.

1425: Began sampling.

1445: disposed purge water into the building.

1510: performed inventory on supplies; we have left.

74 empty coolers, 3 full coolers with bottles.

3 rolls of tubing. 500 ft. 2 gal DI., bag of silicone.

1540: left a site to Seattle.

~~AECOM~~

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: <b>BNSF</b>	Report To: <b>AECOM Renee Knecht</b>	Attention: <b>Bruce Sheppard</b>	Page: <b>1</b> of <b>2</b>		
Address:	Copy To: <b>Dean Kinney</b>	Company Name: <b>BNSF</b>	Invoice No: <b>1470478</b>		
Email To:	Purchase Order No.: <b>TT0100-T39</b>	Address:	REGULATORY AGENCY		
Phone:	Project Name: <b>skykomish</b>	Pace Quote Reference:	<input checked="" type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER		
Requested Due Date/TAT: <b>5/1</b>	Project Number: <b>60191113</b>	Pace Project Manager:	Site Location: <b>WA</b>		
		Pace Profile #:	STATE: <b>WA</b>		

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE  Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Tissue Other	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Y/N	Analysis Test ↑	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
					COMPOSITE START	COMPOSITE END/GRAB	DATE	TIME			DATE	TIME	DATE	TIME	DATE	TIME	H <sub>2</sub> SO <sub>4</sub>					HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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SAMPLER NAME AND SIGNATURE		Temp in °C	Received on	Custody	Sealed Cooler	Samples Intact
PRINT Name of SAMPLER: <b>Mindy Gaddan</b>						
SIGNATURE of SAMPLER: <b>Mindy Gaddan</b>						
DATE Signed (MM/DD/YYYY): <b>09/21/11</b>						

2



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.



Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: <b>BNSE</b>	Report To: <b>Alicia Renee Knecht</b>	Attention: <b>Bruce Sheppard</b>	Company Name: <b>BNSE</b>	Page: <b>1</b> of <b>2</b>	Regulatory Agency <input checked="" type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER _____ Site Location: <b>WA</b> STATE: _____
Address: _____	Copy To: <b>Dean Kinney</b>	Company Address: _____	Address: _____		
Email To: _____	Purchase Order No.: <b>TT0100-T39</b>	Pace Quote Reference: _____	Pace Project Manager: _____		
Phone: _____	Project Name: <b>Skykamish</b>	Pace Project Reference: _____	Pace Profile #: _____		
Requested Due Date/TAT: <b>5/1</b>	Project Number: <b>609113</b>				

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test ↑ Y / N	Requested Analysis Filtered (Y/N)												Pace Project No. / Lab I.D.
						COMPOSITE START	COMPOSITE END/GRAB																	
1	SI-AU - 0911	Drinking Water	SI-AU - 0911	W	9120h	1510		2	2	Unpreserved	XXXXXX													
2	SI-AD	Water	SI-AD			1510		2	2	HCl	XXXXXX													
3	SI-BU	Waste Water	SI-BU			1530		2	2	NaOH	XXXXXX													
4	SI-BD	Product	SI-BD			1535		2	2	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	XXXXXX													
5	SI-AU	Soil/Solid	SI-AU			1600		2	2	HNO <sub>3</sub>	XXXXXX													
6	SI-AD	Oil	SI-AD			1605		2	2	H <sub>2</sub> SO <sub>4</sub>	XXXXXX													
7	SI-BU	Wipe	SI-BU			1670		2	2	Other	XXXXXX													
8	SI-BD	Air	SI-BD			1675		2	2		XXXXXX													
9	SI-AU	Tissue	SI-AU			1640		2	2		XXXXXX													
10	SI-AD	Other	SI-AD			1645		2	2		XXXXXX													
11	SI-BU		SI-BU			1710		2	2		XXXXXX													
12	SI-AD		SI-AD			1715		2	2		XXXXXX													

Section E Additional Comments		Section F Relinquished By / Affiliation		Section G Accepted By / Affiliation		Section H Date		Section I Time		Section J Sample Conditions	
Additional Comments: SCUBA - SI-BU gold cleanup Sample SZ-AU-0911 has extra volume For MS/MSD		Relinquished By / Affiliation: Mary Gaddan AF 9/2/11 0845		Accepted By / Affiliation: Bruce Sheppard BNSE		Date: 09/2/11 0845		Time: 0845		Sample Conditions: Received on _____ Ice (Y/N) _____ Custody (Y/N) _____ Sealed Cooler (Y/N) _____ Samples Intact (Y/N) _____	





## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	BNSF	Report To:	AECOM Renee Knight	Attention:	BNSF Shepard
Address:		Copy To:	Dean Kinney	Company Name:	BNSF
Email To:				Address:	
Phone:		Purchase Order No.:	TT0100-139	Pace Quote Reference:	
Fax:		Project Name:	Skylarkish	Pace Project Manager:	
Requested Due Date/TAT:	STJ	Project Number:	60791113	Pace Profile #:	
Page: 1 of 2 1470478			REGULATORY AGENCY <input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER		
Site Location STATE: WA					

[illegible]

<div style="text-align: center; font-size: 2em; border: 1px solid red; padding: 5px; width: 50px; margin: 0 auto;">4</div>	<b>SAMPLER NAME AND SIGNATURE</b>		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	PRINT Name of SAMPLER: <i>M. A. G. G. G. G.</i>					
	SIGNATURE of SAMPLER: <i>[Signature]</i>					

Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

1. Dec. 5. 52



## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	BNSF	Report To:	AECOM Renee Knecht	Attention:	Bruce Sheppard
Address:		Copy To:	Dean Kinley	Company Name:	BNSF
Email To:				Address:	
Phone:		Purchase Order No.:	TTA100-539	Pace Quote Reference:	
Fax:		Project Name:	Stokomish	Pace Project Manager:	
Requested Due Date/TAT:	5/21/12	Project Number:	609112	Pace Profile #:	

Page: 2 of 2		1470476	
REGULATORY AGENCY			
<input type="checkbox"/> NPDES	<input checked="" type="checkbox"/> GROUND WATER	<input type="checkbox"/> DRINKING WATER	
<input type="checkbox"/> UST	<input type="checkbox"/> RCRA	<input type="checkbox"/> OTHER	
Site Location		STATE: WA	

[illegible]

2	SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	PRINT Name of SAMPLER: Mindy Graden					
	SIGNATURE of SAMPLER: Mindy Graden					
	DATE Signed (MM/DD/YY): 02/21/11					

\*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.







# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.



<b>Section A</b> Required Client Information: Company: <u>BASF</u> Address: <u>BASF</u> Email To: <u>BASF</u> Phone: <u></u> Fax: <u></u> Requested Due Date/TAT: <u>5/1</u>		<b>Section B</b> Required Project Information: Report To: <u>AECOM Renee Knecht</u> Copy To: <u>Dean Kinley</u> Purchase Order No.: <u>TT01DD-339</u> Project Name: <u>skyanish</u> Project Number: <u>6019112</u>		<b>Section C</b> Invoice Information: Attention: <u>Bruce Slagstad</u> Company Name: <u>BASF</u> Address: <u></u> Pace Quote Reference: <u></u> Pace Project Manager: <u></u> Pace Profile #: <u></u>	
Regulatory Agency: <u>NPDES</u> <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER <u></u>		Site Location: <u>WA</u> STATE: <u></u>		Page: <u>2</u> of <u>2</u> 1470476	

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analysis Test ↑	Y/N	Requested Analysis Filtered (Y/N)												Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
				COMPOSITE START	COMPOSITE END/GRAB			DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME														
1	S3-CU	-1011	N	1735			2																						
2	S3-CD	-		1740			2																						
3	S4-AU	-		1810			2																						
4	S4-AD	-		1815			2																						
5	S4-BD	-		1820			2																						
6	S4-BU	-		1825			2																						
7	S4-CD	-		1830			2																						
8	S4-CD	-		1840			2																						
9	S4-CD	-		1845			2																						
10																													
11																													
12																													

<b>Section E</b> ADDITIONAL COMMENTS 5664 - silica gel cleanup		RELINQUISHED BY / AFFILIATION Mundy Foundation AECOM 9/2/10		DATE 9/2/10		TIME 0845		ACCEPTED BY / AFFILIATION Mundy Foundation AECOM		DATE 09/21/10		TIME 0845		SAMPLE CONDITIONS Received on Ice (Y/N) <u>X</u> Sealed Cooler (Y/N) <u>N</u> Samples Intact (Y/N) <u>Y</u>	
SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: <u>Mundy Foundation</u> SIGNATURE of SAMPLER: <u>Mundy Foundation</u>														DATE Signed (MM/DD/YY): <u>09/21/10</u>	

\*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: <b>BNSE</b>	Report To: <b>AECOM Rocco Knecht</b>	Attention: <b>Brice Shoppert</b>	Company Name: <b>BNSE</b>	Page: <b>2</b> of <b>2</b>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>REGULATORY AGENCY</b>  <input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER  <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER _____          Site Location: _____          STATE: <b>WA</b> </div>
Address: _____	Copy To: <b>Dean Kinley</b>	Company Address: _____	Address: _____		
Email To: _____	Purchase Order No.: <b>TT0100-139</b>	Pace Quote Reference: _____	Pace Project Manager: _____		
Phone: _____	Project Name: <b>Skunk Creek</b>	Pace Profile #: _____			
Requested Due Date/TAT: <b>5/1</b>	Project Number: <b>6019113</b>				

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	Matrix Codes DW WT WW P SL OL WP AR TS OT	Matrix Codes Drinking Water Waste Water Product Soil/Solid Oil Wipe Air Tissue Other	SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE	COLLECTED		DATE	TIME	DATE	TIME	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS	Temp in °C	Received on	Ice (Y/N)	Custody (Y/N)	Samples Intact (Y/N)
						COMPOSITE START	COMPOSITE END/GRAB															
1																						
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

<b>Section E</b> Additional Comments		<b>RELINQUISHED BY / AFFILIATION</b>		<b>DATE</b>	<b>TIME</b>	<b>ACCEPTED BY / AFFILIATION</b>	<b>DATE</b>	<b>TIME</b>	<b>SAMPLE CONDITIONS</b>	
		<b>SAMPLER NAME AND SIGNATURE</b>								
		<b>PRINT Name of SAMPLER:</b>								
		<b>SIGNATURE of SAMPLER:</b>								
		<b>DATE Signed (MM/DD/YY):</b>								



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

## Section A

Required Client Information:

Company: BUSE

Address: 1470477

Email To: Dean Knapley

Phone: 544

Requested Due Date/TAT: 5/4

## Section B

Required Project Information:

Report To: AECom Renee Knecht

Copy To: Dean Knapley

Purchase Order No.: TT0100-139

Project Name: Skykomish

Project Number: 60191113

## Section C

Invoice Information:

Attention: Bruce Sheppard

Company Name: BUSE

Address: 1470477

Pace Quote Reference: NA

Pace Project Manager: NA

Pace Profile #: NA

Page: 1 of 2

## Section D

Required Client Information

Matrix Codes  
MATRIX / CODE

Drinking Water DW

Water WT

Waste Water WW

Product P

Soil/Solid SL

Oil OL

Wipe WP

Air AR

Tissue TS

Other OT

## SAMPLE ID

(A-Z, 0-9, /, -)

Sample IDs MUST BE UNIQUE

Matrix Codes

MATRIX / CODE

Drinking Water DW

Water WT

Waste Water WW

Product P

Soil/Solid SL

Oil OL

Wipe WP

Air AR

Tissue TS

Other OT

## Section E

Required Project Information

Matrix Code

(see valid codes to left)

Sample Type

(G=GRAB C=COMP)

Collected

Composite Start

Composite End/Grab

Date

Time

Date

Time

Sample Temp at Collection

# of Containers

Preservatives

Unpreserved

H<sub>2</sub>SO<sub>4</sub>

HNO<sub>3</sub>

HCl

NaOH

Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>

Methanol

Other

Analysis Test

Residual Chlorine (Y/N)

Pace Project No./ Lab I.D.

Requested Analysis Filtered (Y/N)

Temp in °C

Received on

Ice (Y/N)

Custody

Sealed Cooler

Samples Intact

DATE Signed

(MM/DD/YY)

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER:

SAMPLER NAME AND SIGNATURE

DATE Signed

(MM/DD/YY)

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER:

SAMPLER NAME AND SIGNATURE

DATE Signed

(MM/DD/YY)

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER:

SAMPLER NAME AND SIGNATURE





# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

## Section A

### Required Client Information:

Company:	BNSF	Report To:	AFCON Renee Knott	Attention:	Bruce Sheppard
Address:		Copy To:	Dean Kinney	Company Name:	BNSF
Email To:		Purchase Order No.:	TT0100-339	Address:	
Phone:		Project Name:	Skrumish	Pace Quote Reference:	
Requested Due Date/TAT:	5/1	Project Number:	60191113	Pace Project Manager:	
				Pace Profile #:	

## Section B

### Required Project Information:

Regulatory Agency:	BNSF	NPDES	<input checked="" type="checkbox"/>	GROUND WATER	<input checked="" type="checkbox"/>	DRINKING WATER	<input type="checkbox"/>
		UST	<input type="checkbox"/>	RCRA	<input type="checkbox"/>	OTHER	<input type="checkbox"/>
Site Location	WA	STATE:					

## Section C

### Invoice Information:

Invoice Number:	1470477	Page:	1	of	2
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## Section D

### Required Client Information

ITEM #	Matrix Codes MATRIX / CODE	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test ↑	Requested Analysis Filtered (Y/N)	Pace Project No. / Lab I.D.					
		COMPOSITE START	COMPOSITE END/GRAB											
1	MW-4 - 0911	DATE	TIME	DATE	TIME	Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other	Y/N
2	MW-400 -	9/19/11	1005	1070	1070	1172	1172	1172	1172	1172	1172	1172	1172	1172
3	2A-W-10	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045	1045
4	2A-W-9	1115	1115	1115	1115	1115	1115	1115	1115	1115	1115	1115	1115	1115
5	2B-W-4	1310	1310	1310	1310	1310	1310	1310	1310	1310	1310	1310	1310	1310
6	MW-3	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350
7	5-W-43	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450	1450
8	GW-1	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545
9	1C-W-1	1070	1070	1070	1070	1070	1070	1070	1070	1070	1070	1070	1070	1070
10	1C-W-8	1110	1110	1110	1110	1110	1110	1110	1110	1110	1110	1110	1110	1110
11	1C-W-3	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
12	1C-W-4	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440

### ADDITIONAL COMMENTS

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Mindy Zunder ACUM	9/21/11	0845	ACUM	0921/11	0845	Y N Y

### SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:	DATE Signed (MM/DD/YYYY):
Mindy Zunder	9/21/11
SIGNATURE of SAMPLER:	
Mindy Zunder	



## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	BUSE	Report To:	AECOM Renzo Kniff	Attention:	Bruce Sheppard
Address:		Copy To:	Dean Kloddy	Company Name:	BUSE
				Address:	
Email To:		Purchase Order No.:	TTO100-339	Pace Quote Reference:	
Phone:		Project Name:	Skylomish	Pace Project Manager:	
		Requested Due Date/TAT:	6/19/13	Pace Profile #:	

Page: 1 of 2	1470477	
REGULATORY AGENCY		
<input type="checkbox"/> NPDES	<input checked="" type="checkbox"/> GROUND WATER	<input type="checkbox"/> DRINKING WATER
<input type="checkbox"/> UST	<input type="checkbox"/> RCRA	<input type="checkbox"/> OTHER
Site Location		STATE: WA

[illegible]

4	SAMPLER NAME AND SIGNATURE		Temp In °C	Received on	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	PRINT Name of SAMPLER: <i>Mindy Anderson</i>					
	SIGNATURE of SAMPLER: <i>Mindy Anderson</i>		DATE Signed (MM/DD/YY): <i>9/21/16</i>			

Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: BNSF	Report To: AECOM	Attention: Bruce Steppa	Page: 2 of 2		
Address:	Copy To: Dean Kinney	Company Name: BNSF	1470479		
Email To:	Purchase Order No.: T10100-739	Address:	REGULATORY AGENCY		
Phone:	Project Name: Skyway	Pace Quote Reference:	<input checked="" type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER		
Requested Due Date/TAT: STD	Project Number: 6019113	Pace Project Manager:	Site Location: WA	STATE: WA	

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	SAMPLE ID (A-Z, 0-9 / -)	Matrix Codes MATRIX / CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test ↑ Y/N	Requested Analysis Filtered (Y/N)												Residual Chlorine (Y/N)	Pace Project No. / Lab I.D.
						COMPOSITE START	COMPOSITE END/GRAB																		
1		Drinking Water	1C-W-2-0911	DW		9/21/11	1535	9/21/11	2	Unpreserved															
2		Water	1B-W-2-	WT			1635		2	HCl															
3		Waste Water	1B-W-3-	WW			1750		2	NaOH															
4		Product	MW-38R-	P			1820		2	HNO <sub>3</sub>															
5		Soil/Solid	EW-1-	SL			1110		2	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>															
6		Oil	2A-W-41-	OL			1710		2	Unpreserved															
7		Wipe	2A-W-40-	WP			1430		2	HCl															
8		Air	2A-W-400-	AR			1320		2	HNO <sub>3</sub>															
9		Tissue	GW-3-	TS			1540		2	Unpreserved															
10		Other	2A-W-47-	OT			1440		2	HCl															
11							1640		2	Unpreserved															
12							1320		2	Unpreserved															

SAMPLER NAME AND SIGNATURE		DATE SIGNED (MM/DD/YY): 09/21/11	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: Mindy Gaddes					
SIGNATURE of SAMPLER: Mindy Gaddes					

\*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

<b>Section A</b> Required Client Information: Company: <u>BNSF</u> Address: _____ Email To: _____ Phone: _____ Fax: _____ Requested Due Date/TAT: <u>STD</u>		<b>Section B</b> Required Project Information: Report To: <u>Ascom</u> Copy To: <u>Dean Kinney</u> Purchase Order No.: <u>TT0100-739</u> Project Name: <u>skykovich</u> Project Number: <u>60191113</u>		<b>Section C</b> Invoice Information: Attention: <u>Bruce Shopp</u> Company Name: <u>BNSF</u> Address: _____ Pace Quote Reference: _____ Pace Project Manager: _____ Pace Profile #: _____		Page: <u>2</u> of <u>2</u> 1470479 <b>REGULATORY AGENCY</b> <input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER _____ Site Location: <u>WA</u> STATE: _____	
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Section D Required Client Information		Matrix Codes MATRIX / CODE Drinking Water DW Waste Water WT Product P Soil/Solid SL Oil OL Wipe WP Air AR Tissue TS Other OT		MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION		# OF CONTAINERS		Preservatives							Y/N ↑	Analysis Test ↑				Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
						DATE	TIME	DATE	TIME			Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					</

<b>SAMPLER NAME AND SIGNATURE</b> PRINT Name of SAMPLER: <u>Minley Braden</u> SIGNATURE of SAMPLER: <u>Minley Braden</u>		DATE Signed (MM/DD/YYYY): <u>09/21/11</u>	
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## CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	BNSF	Report To:	AECOM	Attention:	Bruce Sheppard
Address:		Copy To:	Dean Kinney	Company Name:	BNSF
Email To:				Address:	
Phone:		Purchase Order No.:	TT0100-739	Pace Quote Reference:	
Fax:		Project Name:	skykomish	Pace Project Manager:	
Requested Due Date/TAT:	std	Project Number:	60191113	Pace Profile #:	

Page: 2 of 2	1470479	REGULATORY AGENCY	
		<input type="checkbox"/> NPDES	<input checked="" type="checkbox"/> GROUND WATER
		<input type="checkbox"/> UST	<input type="checkbox"/> RCRA
		<input type="checkbox"/>	<input type="checkbox"/> DRINKING WATER
		<input type="checkbox"/>	<input type="checkbox"/> OTHER
Site Location		STATE: WY	

[illegible]

**\*Important Note:** By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.



## Section A

### Required Client Information:

Company: BNSF  
 Address: \_\_\_\_\_  
 Email To: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 Requested Due Date/TAT: std

## Section B

### Required Project Information:

Report To: AECOM  
 Copy To: Renee Knecht  
 Purchase Order No.: 110100-539  
 Project Name: skykomish  
 Project Number: CO191113

## Section C

### Invoice Information:

Attention: Bruce Sheppard  
 Company Name: BNSF  
 Address: \_\_\_\_\_  
 Pace Quote Reference: \_\_\_\_\_  
 Pace Project Manager: \_\_\_\_\_  
 Pace Profile #: \_\_\_\_\_

REGULATORY AGENCY  
☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER  
☐ UST ☐ RCRA ☐ OTHER \_\_\_\_\_  
 Site Location: WA  
 STATE: WA

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED			SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test ↑	Y/N	Requested Analysis Filtered (Y/N)												Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
				COMPOSITE START	COMPOSITE END/GRAB	DATE			TIME	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol			Other																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		

SAMPLER NAME AND SIGNATURE  
 PRINT Name of SAMPLER: Dee Kinney  
 SIGNATURE of SAMPLER: [Signature]  
 DATE Signed (MM/DD/YY): 9/22/11



## Fluid Level Gauging Form

Project Name: BNSF Skykomish		Project Number: 60191113		Collected by:									
Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	DTW (ft)	Prod. Thick. (ft)	9/20/2010 DTW (ft)	Prod. Thick. (ft)	Sign Off	Comments
1A-W-4	09/19/11	1147		10.13	None		WL	8.88		9.47		MG	
1A-W-5				NM				NM		NM			Well abandoned
1A-W-38				NM				NM		NM			Not Installed
1B-W-2		1226		14.48	None		WL	14.54		13.51		AS	
1B-W-3		1125		15.26	None			14.58		14.91		MG	
1C-W-1		1052		13.93	None		↓	13.02		13.63		MG	
1C-W-2				NM				NM		NM			Well destroyed during sewer work
1C-W-3		1108		11.73	None		WL	10.38		10.87		MG	
1C-W-4		1114		10.59				10.06		10.45			
1C-W-7		1044		12.64				10.75		11.52			
1C-W-8		1059		13.38				12.31		12.98			
2A-W-5		1137		14.90				11.94		13.95		AS	
2A-W-7		1421		17.49				11.01		11.81			
2A-W-8		1731		16.26				14.13		15.00			
2A-W-9		1050		12.35				9.78		11.41			
2A-W-10		1015		12.66				9.47		11.54		DWK	
2B-W-4		1247		4.86	↓		↓	2.25		3.81		DWK	
5-W-4				NM				NM		NM			Well abandoned
5-W-14		1445		9.83	None		WL	9.19		9.19		MG	
5-W-15		1430		8.40				7.67		7.75			
5-W-16		1415		8.60				8.00		8.02			
5-W-17		1475		8.00				7.36		7.35			
5-W-18		1405		8.07				7.47		7.52			
5-W-19		1402		7.91	↓		↓	7.36		7.44			
5-W-20				NM				6.90		7.00			Well abandoned
5-W-42				NM				6.56		6.75			Well abandoned
5-W-43		1245		8.70	None		WL	6.96		NM		MG	
5-W-44				NM				NM		NM			Not Installed
5-W-50		1434		8.27	None		WL	6.86		7.24		MG	
5-W-52				NM				NM		NM			Well abandoned
5-W-53				NM				NM		NM			Well abandoned
5-W-54		1515		7.60	None		WL	6.48		6.85		MG	
5-W-55		1571		7.29	↓		↓	6.27		6.42			
5-W-56		1503		7.90	↓		↓	7.02		6.58			

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	3/21/2011		9/20/2010		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
MW-1	09/29/11	1119	—	13.72	None	—	WL	11.85		13.09		AS	
MW-2		1444	—	13.35		—		11.35		12.70		↓	
MW-3		1107	—	11.89		—		7.80		10.78		↓	
MW-4		0935	—	11.30		—		7.84		10.12		DWL	
MW-5		1140	—	9.15		—		6.54		8.19		AS	
MW-9		1030	—	14.93		—		11.75		13.32		↓	
MW-10		1124	—	14.12		—		11.32		13.10		↓	
MW-11		1147	—	14.53	↓	—		12.00	TR	13.73		↓	clean, strong odor
MW-12		—	—	NM	—	—	—	NM		NM		—	Well abandoned
MW-12R		—	—	NM	—	—	—	NM		NM		—	Not Installed
MW-13		1054	—	11.30	None	—	WL	9.01		10.31		AS	
MW-14		1051	13.5	13.40		—		10.96		12.28		—	
MW-15		1049	—	15.06		—		12.09		13.52		—	
MW-16		1706	—	14.43		—		12.81		13.57		—	
MW-18		1134	—	15.98		—		13.35		15.10		—	
MW-32		1212	—	9.95		—		8.88		9.19		—	
MW-38R		1352	—	5.56		—		4.43		4.92		MG	
MW-40		1044	—	14.57	↓	—		11.59		12.98		AS	
1A-W-36		—	—	NM	—	—	—	NM		NM		—	Not Installed
1A-W-37		—	—	NM	—	—	—	NM		NM		—	Not Installed
1B-W-23		1137	—	16.66	None	—		16.22		16.52		MG	
1B-W-24		—	—	NM	—	—		NM		NM		—	Not Installed
2A-W-40		1200	—	13.06	None	—		11.84		12.42		MG	
2A-W-41		1805	—	17.31	None	—	WL	16.31		17.14		MG	
2A-W-42		1350	—	12.79	None	—	WL	11.88		9.65		AS	
2B-W-45		—	—	NM	—	—		NM		NM		—	Well abandoned
2B-W-46		—	—	NM	—	—		NM		NM		—	Well abandoned
2B-W-47		—	—	NM	—	—		NM		NM		—	Not Installed
2B-W-48		—	—	NM	—	—		NM		NM		—	Not Installed
3-W-41		—	—	NM	—	—		NM		NM		—	Well abandoned
3-W-42		—	—	NM	—	—		NM		NM		—	Well abandoned
3-W-43		—	—	NM	—	—		NM		NM		—	Well abandoned



Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	3/21/2011		9/20/2010		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
EW-1	9/19/11	1543	-	10.34	None	-	WL	9.02		9.55		MG	
EW-2A		1740	-	11.30		-		NM		NM		AS	
GW-1		1745	-	10.50		-		9.05		9.83		MG	
GW-2		1741	-	17.97		-		11.55		12.39		"	
GW-3		1770	-	15.79		-		16.38		15.73		AS	
GW-4		1737	-	10.47		-		9.35		10.25		"	
PZ-1R		0913	Elevation: 924.8			-				10.20		DWK	
PZ-2N		0914		923.7		-				11.63			
PZ-2S				923.6		-				9.83			
PZ-3N				921.1		-				13.97			
PZ-3S				922.7	None	TR				10.38			
PZ-4N				921.1	"	-				14.64			
PZ-4S				921.6	None	TR				11.79			
PZ-5N				919.0	"	-				10.24			
PZ-5S				920.5		-			Hwy Tr	9.93	Hwy Tr		
PZ-6N				917.4	None	-				13.29			
PZ-6S				919.5		-			Hwy Tr	8.53	Hwy Tr		
PZ-7N				917.5	None	-				12.40			
PZ-7S				919.7		-				9.08			
PZ-8		0913		918.2		-				10.20			
FWW		1515	-	11.56		-	WL					AS	
VW		1539	-	14.76		-							
CV		1508	-	16.86		-							
EV		1456	-	10.02		-							
PW-04		1514	-	13.10		-							

IN-01	1501 - 8.78	Treatment-Bldg	DWK
RW-2	0913 918.4 (elution)	" "	" "
RW-5	0912 917.3 ( " )	" "	" "



Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	9/20/2011				Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-3	9/19/11	0928	—	12.86	NONE	TR	TP	10.95	Hvy TR	10.95	Hvy TR		heavy trace
MW-7	9/19/11	0911	—	14.13	NONE	—	TP	13.23	None	13.23	None		
2A-W-11	—	—	—	NM	—	—	—	NM	—	NM	—		Well abandoned
MW-28	—	—	—	NM	—	—	—	14.55	None	14.55	None		Well abandoned
MW-39	—	—	—	NM	—	—	—	NM	—	NM	—		Well abandoned
5-W-51	9/19/11	0949	—	8.20	NONE	TR	TOP	7.51	TR	7.51	TR		
1A-W-2	—	—	—	NM	—	—	—	NM	—	NM	—		Not located (in construction zone)
2A-W-4	09/19/11	0939	—	13.41	NONE	TR	TP	10.76	Hvy TR	10.76	Hvy TR		Trace
5-W-2	—	—	—	NM	—	—	—	NM	—	NM	—		Well abandoned
5-W-3	—	—	—	NM	—	—	—	NM	—	NM	—		Well abandoned
MW-22	—	—	—	NM	—	—	—	NM	—	NM	—		Well abandoned

## Other Notes:

- ☒ dirty casing, possible trace product  
☒ use tape and paste (TP) + peristaltic pump (PP)  
☒ dirty well

Well Number	Date	Time	Total Casing Depth	Depth to Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness	Method	3/21/2011		9/20/2010		Sign Off	Comments
								DTW (ft)	Prod. Thick. (ft)	DTW (ft)	Prod. Thick. (ft)		
2A-W-3	03/21/11							10.95	Hvy TR	10.95	Hvy TR		
MW-7								13.23	None	13.23	None		
2A-W-11				NM				NM		NM			Well abandoned
MW-28				NM				14.55	None	14.55	None		Well abandoned
MW-39				NM				NM		NM			Well abandoned
5-W-51								7.51	TR	7.51	TR		
1A-W-2				NM				NM		NM			Not located (in construction zone)
2A-W-4								10.76	Hvy TR	10.76	Hvy TR		
5-W-2				NM				NM		NM			Well abandoned
5-W-3				NM				NM		NM			Well abandoned
MW-22				NM				NM		NM			Well abandoned

4 PZ 3, 4, 5, 6

Other Notes:

- ☒ dirty casing, possible trace product use tape and paste (TP)  
☒ dirty well use tape & paste (TP) + peristaltic pump (PP)

Survey location	Measurement (ft)	Time
5-W-17	11.22	1605
SK-5	19.83	1616
SK-4	18.54	1617
SK-3	16.48	1622
1B-W-3	4.71	1635
SK-2	23.07	1646
GW-4	6.10	1657
FW-2A	4.54	1654
SK-1	16.95	1702

back sight  
fore sight  
fore sight  
fore sight  
back sight  
fore sight  
back sight  
back sight  
fore sight

# GROUNDWATER SAMPLING LOG

Project No. 60191113

9/19/11

ZB-W-4

Sampled By

DWIC

P. Cloudy, 65 °F

WELL INFORMATION		
Depth to water	4,86	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	None	(ft)
Screen interval:		
well condition:	OK	

Depth to water	4.86	(ft)
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Depth of well: (ft)

Well diameter:	2	(in)
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Feet of water: (ft)

Product thickness:	None	(ft)
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Screen interval:

well condition: *ok*

[illegible]

Tabling Inlet at  $\approx 515'$

PURGE DATA	
1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20
21	22
23	24
25	26
27	28
29	30
31	32
33	34
35	36
37	38
39	40
41	42
43	44
45	46
47	48
49	50
51	52
53	54
55	56
57	58
59	60
61	62
63	64
65	66
67	68
69	70
71	72
73	74
75	76
77	78
79	80
81	82
83	84
85	86
87	88
89	90
91	92
93	94
95	96
97	98
99	100

start purge time	1750
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time		1500	1303	1306	1309
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DTW	(ft)	4.89	4.89	4.89	4.89
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purge rate	(L/min)	0.30	—	—	—
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pH	(Units)	5.15	5.14	5.12	5.11
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conductivity	(umhos/cm)	0.121	0.129	0.125	0.116
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temperature	(deg C)	11.8	11.9	11.9	11.9
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D.O.	(mg/L)	3.30	3.20	3.71	3.14
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ORP	(mv)	279	284	268	293
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turbidity	(NTU)	6.48	4.93	4.61	4.73
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purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing
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SAMPLE INFORMATION	
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sample number	time	analysis	container	# bottles	preservative
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2B-WF4-0911	1310	NWTPH-Dx	1L Gl. Amber	2	HCl
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# GROUNDWATER SAMPLING LOG

Date 9/19/11

weather P. Clouds 65°F

WELL INFORMATION		
Depth to water	10.52	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	None	(ft)
Screen interval:		
well condition:	ok	

[illegible]

PURGE DATA	
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
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95	95
96	96
97	97
98	98
99	99
100	100

start purge time	1514							
time		1535	1538	1541				
DTW	(ft)	10.67	10.62	10.62				
purge rate	(L/min)	0.30						
pH	(Units)	5.68	5.76	5.78				
conductivity	(umhos/cm)	0.126	0.129	0.132				
temperature	(deg C)	12.5	12.1	12.1				
D.O.	(mg/L)	0.80	0.80	0.80				
ORP	(mv)	216	210	206				
turbidity	(NTU)	10.90	10.71	10.75				
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

SAMPLE INFORMATION	
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[illegible]





# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60191113

Date 9/19/11

Well No. MW-4

Sampled By DWK

weather P. cloudy, 50 °F

## WELL INFORMATION

Depth to water 11.30 (ft)  
 Depth of well: (ft)  
 Well diameter: (in)  
 Feet of water: (ft)  
 Product thickness: None (ft)  
 Screen interval:  
 well condition: ok

## COMMENTS

Tablog Inlet at ~ 12.0'

## PURGE DATA

start purge time	0942						
time	0952	0955	0958	1001			
DTW (ft)	11.37	11.37	11.37	11.37			
purge rate (L/min)	0.30						
pH (Units)	5.65	5.49	5.42	5.39			
conductivity (umhos/cm)	0.142	0.145	0.155	0.151			
temperature (deg C)	11.2	11.2	11.2	11.2			
D.O. (mg/L)	1.77	1.71	1.64	1.62			
ORP (mv)	248	259	271	277			
turbidity (NTU)	4.47	4.37	4.19	4.01			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
MW-4-0911	1005	NWTPH-Dx	1L Gl. Amber	2	HCl
MW-400-0911 (Duplicate)	1020	"	"	1	"

# GROUNDWATER SAMPLING LOG

9/20/11

weather

~~EW 2A~~ (u)

11G

Sunny

30°F

WELL INFORMATION	
Depth to water	5.52 (ft)
Depth of well:	(ft)
Well diameter:	(in)
Feet of water:	(ft)
Product thickness:	(ft)
Screen interval:	
well condition:	OK

[illegible][illegible]

Peristaltic pump and silicone/polyethylene tubing

4.99

4.72

$$4.73$$
[illegible]

SAMPLE INFORMATION	
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HCl

19



# GROUNDWATER SAMPLING LOG

Project No. 60191113

9/20/11

EW-

Sampled By UG

weather Sunny 70 °F

WELL INFORMATION	
Depth to water	10.28 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	— (ft)
Screen interval:	
well condition:	ok

[illegible]

PURGE DATA	
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[illegible]

SAMPLE INFORMATION	
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[illegible]



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60191113

Date 9/20/11

Well No. GW-3

Sampled By MG

weather Sunny 80's °F

## WELL INFORMATION

Depth to water 15.78 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: - (ft)  
 Screen interval:  
 well condition: ok

## COMMENTS

## PURGE DATA

start purge time	1515							
time	1	1630	1533	1536				
DTW	(ft)	16.58	16.60	16.63				
purge rate	(L/min)	.35	.35	.35				
pH	(Units)	6.33	6.31	6.30				
conductivity	(umhos/cm)	40	41	41				
temperature	(deg C)	8.71	8.67	8.75				
D.O.	(mg/L)	7.39	7.22	7.04				
ORP	(mv)	102.1	103.6	102.5				
turbidity	(NTU)	45.4	45.8	45.4				
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
GW-3-0911	1540	NWTPH-Dx	1L Gl. Amber	2	HCl
GW-3-0-0911	1440	"	"	"	"
(Duplicate)					



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60191113

Date 9/20/11

Well No. ZA-W-40

Sampled By MG

weather Sunny 80°F

## WELL INFORMATION

Depth to water 13.14 (ft)  
 Depth of well: (ft)  
 Well diameter: 2 (in)  
 Feet of water: (ft)  
 Product thickness: — (ft)  
 Screen interval:  
 well condition: OK

## COMMENTS

## PURGE DATA

start purge time	1405						
time		1420	1423	1426			
DTW	(ft)	13.17	13.17	13.17			
purge rate	(L/min)	.35	.35	.35			
pH	(Units)	6.52	6.50	6.50			
conductivity	(umhos/cm)	32	32	32			
temperature	(deg C)	11.08	10.89	10.75			
D.O.	(mg/L)	7.74	7.94	8.15			
ORP	(mv)	71.0	78.9	76.2			
turbidity	(NTU)	0.97	0.92	0.15			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
2A-W-40-0911	1430	NWTPH-Dx	1L Gl. Amber	2	HCl
2A-W-40-0911 (Duplicate)	1330				

























# GROUNDWATER SAMPLING LOG

Project No. 60191113

Date 9/20/11

Sampled By Cahyadi Sribane

weather sunny 78 °F

WELL INFORMATION		
Depth to water	12.58	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	—	(ft)
Screen interval:		
well condition:	Good	

**COMMENTS**

Inlet tubing = 13.50'

purge water is clear

[illegible]

start purge time	1515
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time		1525	1528	1531	1534
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DTW	(ft)	12.58	12.58	12.58	12.58
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purge rate	(L/min)	250	250	250	250
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pH	(Units)	6.06	6.25	6.37	6.44
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conductivity	(umhos/cm)	0.057	0.061	0.061	0.062
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temperature	(deg C)	14.27	14.17	14.14	14.08
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D.O.	(mg/L)	5.79	7.24	7.51	8.20
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ORP	(mv)	-40.4	-38.2	-37.6	-37.0
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turbidity	(NTU)	1.40	0.97	1.22	0.89
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purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing
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## SAMPLE INFORMATION

sample number	time	analysis	container	# bottles	preservative
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1K-W-2-0911	1535	NWTPH-Dx	1L Gl. Amber	2	HCl
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[illegible]

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# GROUNDWATER SAMPLING LOG

weather sunny 75 °F

WELL INFORMATION		
Depth to water	13.31	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	—	(ft)
Screen interval:		
well condition:	Good	

COMMENTS
Inlet tubing 14.50"
purge water is clear

PURGE DATA								
start purge time	1043							
time		1053	1056	1059	1102	1105	1107	
DTW	(ft)	13.33	13.33	13.33	13.33	13.33	13.33	
purge rate	(L/min)	280	280	280	280	280	280	
pH	(Units)	6.02	6.04	6.02	6.01	6.02	6.01	
conductivity	(umhos/cm)	0.056	0.057	0.057	0.057	0.057	0.057	
temperature	(deg C)	15.77	15.79	15.94	16.08	16.12	15.98	
D.O.	(mg/L)	1.63	1.62	1.50	1.66	1.70	1.77	
ORP	(mv)	-116.7	-116.3	-118.5	-119.1	-113.0	-114.4	
turbidity	(NTU)	6.99	2.66	1.80	1.83	0.77	0.59	
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

[illegible]







Well No. GW-2

Sampled By Chani S. Sane

weather cloudy 69 °F

## WELL INFORMATION

well condition: *Good*

## COMMENTS

## PURGE DATA

purge and sample equip.	Peristaltic pump a
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Peristaltic pump and silicone/polyethylene tubing

## SAMPLE INFORMATION

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10 F 2.

## GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish

Project No. 60191113

Date 9/21/11

Well No. 6W-2

Sampled By Glenn Sebano

weather cloudy 69 °F

## WELL INFORMATION

Depth to water 1301 (ft)

Depth of well: \_\_\_\_\_ (ft)

Well diameter: 2 (in)

Feet of water: (ft)

Product thickness: \_\_\_\_\_ (ft)

Screen interval: \_\_\_\_\_

well condition: Good

## COMMENTS

Inlet tubing  $\approx 14 \text{ ft}$

purge water loop from  
Flake cleared later on

### PURGE DATA

start purge time	1106							
time		1116	1119	1122	1125	1128	1131	1134
DTW	(ft)	13.01	13.01	13.01	NM	NM	NM	NM
purge rate	(L/min)	250	250	250	250	250	250	250
pH	(Units)	6.27	6.25	6.24	6.25	6.26	6.26	6.27
conductivity	(umhos/cm)	0.143	0.119	0.108	0.098	0.094	0.093	0.092
temperature	(deg C)	11.52	11.42	11.52	11.49	11.55	11.60	11.48
D.O.	(mg/L)	0.70	0.59	0.52	0.52	0.53	0.50	0.48
ORP	(mv)	-116.7	-116.9	-119.5	-119.7	-119.0	-118.6	-119.1
turbidity	(NTU)	9.84	7.67	4.38	2.55	2.31	2.28	1.14
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

## SAMPLE INFORMATION

[illegible]





# GROUNDWATER SAMPLING LOG

Project No. 60191113

Date 9/21/11

Well No. E-W-50

Sampled By Ghassan Sebban

weather cloudy 59 °F

WELL INFORMATION		
Depth to water	8.10	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	—	(ft)
Screen interval:		
well condition:	Good	

COMMENTS

Inlet tubing is 9.50"  
pr. ge water is clear.

PURGE DATA	
1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20
21	22
23	24
25	26
27	28
29	30
31	32
33	34
35	36
37	38
39	40
41	42
43	44
45	46
47	48
49	50
51	52
53	54
55	56
57	58
59	60
61	62
63	64
65	66
67	68
69	70
71	72
73	74
75	76
77	78
79	80
81	82
83	84
85	86
87	88
89	90
91	92
93	94
95	96
97	98
99	100

start purge time	1001							
time		1011	1014	1019	1022	1025		
DTW	(ft)	8.58	8.71	8.73	8.73	8.73		
purge rate	(L/min)	250	250	200	200	200		
pH	(Units)	6.06	6.11	6.13	6.14	6.14		
conductivity	(umhos/cm)	0.426	0.456	0.455	0.462	0.461		
temperature	(deg C)	15.17	15.28	15.35	15.45	15.59		
D.O.	(mg/L)	0.47	0.49	0.43	0.42	0.41		
ORP	(mv)	-107.2	-111.7	-112.5	-114.8	-109.4		
turbidity	(NTU)	11.90	10.10	7.33	7.89	7.10		
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

SAMPLE INFORMATION	
--------------------	--

[illegible]

school

Project name BNSF-Skykomish

Project No. 60191113

Date \_\_\_\_\_

Well No.. 5-W-55

Sampled By Ghani S. S. Sane

weather cloudy 50 °F

## WELL INFORMATION

Depth to water 7.34 (ft)

Depth of well: \_\_\_\_\_ (ft)

Well diameter: 2 (in)

Feet of water: (ft)

Product thickness: (ft)

Screen interval:

well condition: Good

## COMMENTS

Inlet tubing = 8.50

purge water is clear

### PURGE DATA

start purge time	0904								
time		0914	0917	0920	0923	0926	0929	0932	0935
DTW	(ft)	7.49	7.49	7.49	7.49	7.49	NM	NM	NM
purge rate	(L/min)	250	250	250	250	250	250	250	250
pH	(Units)	5.99	5.97	5.97	5.96	5.96	5.96	5.97	5.97
conductivity	(umhos/cm)	0.096	0.097	0.097	0.097	0.098	0.097	0.098	0.098
temperature	(deg C)	13.73	13.69	13.71	13.78	13.86	13.91	14.01	14.20
D.O.	(mg/L)	0.81	0.53	0.43	0.39	0.36	0.34	0.35	0.34
ORP	(mv)	-77.2	-79.4	-85.4	-88.8	-91.1	-91.1	-91.4	-92.8
turbidity	(NTU)	4.00	3.01	2.15	1.59	1.64	1.34	0.74	0.68
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing								

## SAMPLE INFORMATION

[illegible]



# GROUNDWATER SAMPLING LOG

Date 9/21/11

weather cloudy 70 °F

WELL INFORMATION		
Depth to water	7.58	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	—	(ft)
Screen interval:		
well condition:	Good	

[illegible]

PURGE DATA	
1	2
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89	90
91	92
93	94
95	96
97	98
99	100

start purge time	1438							
time		1448	1451	1454	1457	1500	1503	1506
DTW	(ft)	7.62	7.62	7.62	7.62	7.62	NM	NM
purge rate	(L/min)	250	250	250	250	250	250	250
pH	(Units)	6.26	6.25	6.24	6.22	6.21	6.22	6.21
conductivity	(umhos/cm)	0.118	0.117	0.114	0.114	0.113	0.111	0.109
temperature	(deg C)	15.59	15.60	15.18	15.21	15.12	14.81	14.93
D.O.	(mg/L)	0.51	0.38	0.30	0.25	0.23	0.22	0.21
ORP	(mv)	-106.9	-107.9	-112.6	-111.6	-116.4	-115.4	-112.7
turbidity	(NTU)	0.64	0.57	0.71	0.68	0.58	0.61	0.60
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing							

SAMPLE INFORMATION	
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95	96
97	98
99	100

[illegible]





# GROUNDWATER SAMPLING LOG

weather Cloudy, 55 °F

WELL INFORMATION		
Depth to water	8.42	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	None	(ft)
Screen interval:		
well condition:	o/c	

[illegible]

PURGE DATA	
------------	--

purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing
-------------------------	---

SAMPLE INFORMATION	
--------------------	--

[illegible]





# GROUNDWATER SAMPLING LOG

Date 9/10/11

weather P. clouds 65°F

WELL INFORMATION		
Depth to water	8,21	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	None	(ft)
Screen interval:		
well condition:	ok	

[illegible]

		PURGE DATA							
start purge time		1419							
time		1429	1432	1435	1438	1441	1444	1447	
DTW	(ft)	8.21							
purge rate	(L/min)	0.30							
pH	(Units)	4.92	4.90	5.00	5.04	5.04	5.09	5.12	
conductivity	(umhos/cm)	0.071	0.079	0.074	0.069	0.066	0.062	0.061	
temperature	(deg C)	11.1	11.0	11.0	11.0	11.1	11.1	11.1	
D.O.	(mg/L)	2.14	2.10	2.08	2.05	2.02	2.02	2.02	
ORP	(mv)	250	255	261	273	281	282	282	
turbidity	(NTU)	71.1	67.7	34.5	21.7	11.6	10.9	10.5	
purge and sample equip.		Peristaltic pump and silicone/polyethylene tubing							

[illegible]



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60191113  
Date 9/21/11

Well No. S-W-18  
Sampled By DWK  
weather P, Cloudy, 65 °F

WELL INFORMATION	
Depth to water	8.30 (ft)
Depth of well:	(ft)
Well diameter:	(in)
Feet of water:	(ft)
Product thickness:	(ft)
Screen interval:	
well condition:	

COMMENTS
Tubing Inlet at ~ 9.0'

PURGE DATA							
start purge time	1126						
time		1136	1139	1142			
DTW	(ft)	0.30	8.31	8.31			
purge rate	(L/min)	8.31	0.30	0.30			
pH	(Units)	6.91	6.90	6.89			
conductivity	(umhos/cm)	0.087	0.090	0.092			
temperature	(deg C)	10.5	10.5	10.5			
D.O.	(mg/L)	2.42	2.42	2.30			
ORP	(mv)	9.5	9.2	9.8			
turbidity	(NTU)	7.87	7.67	7.31			
purge and sample equip.		Peristaltic pump and silicone/polyethylene tubing					

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
S-W-18-0911	1145	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl



# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60191113  
Date 9/21/11

Well No. S-W-17  
Sampled By DWK  
weather cloudy, 65 °F

WELL INFORMATION		
Depth to water	8.19	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	None	(ft)
Screen interval:		
well condition:	ok	

COMMENTS
Tubing inlet at ~9.0'

PURGE DATA							
start purge time	1340						
time		1330	1333	1336			
DTW	(ft)	8.20					
purge rate	(L/min)	0.30					
pH	(Units)	7.35	7.34	7.34			
conductivity	(umhos/cm)	0.109	0.109	0.109			
temperature	(deg C)	15.5	15.6	15.6			
D.O.	(mg/L)	2.14	2.10	2.01			
ORP	(mv)	-23.3	-23.2	-23.0			
turbidity	(NTU)	1.70	1.11	1.08			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
S-W-17-0911	1340	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl
S-W-17-0911	1355	"	"	"	"
(Duplicate)		"	"	"	"





# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60191113  
Date 9/21/11

Well No. 5-W-15  
Sampled By DWK  
weather cloudy, 55 °F

WELL INFORMATION	
Depth to water	8.62 (ft)
Depth of well:	(ft)
Well diameter:	2 (in)
Feet of water:	(ft)
Product thickness:	None (ft)
Screen interval:	
well condition:	ok

COMMENTS
Tubing inlet at ~ 9.25'

PURGE DATA							
start purge time	1010						
time		1020	1022	1026	1029		
DTW	(ft)	8.68	8.69	8.69	8.69		
purge rate	(L/min)	0.30					
pH	(Units)	7.21	7.22	7.22	7.23		
conductivity	(umhos/cm)	0.141	0.141	0.141	0.141		
temperature	(deg C)	10.0	10.1	10.1	10.1		
D.O.	(mg/L)	2.23	2.13	2.05	2.01		
ORP	(mv)	-49	-52	-53	-54		
turbidity	(NTU)	5.56	3.39	3.11	3.31		
purge and sample equip.		Peristaltic pump and silicone/polyethylene tubing					

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
5-W-15-0911	1030	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl

# GROUNDWATER SAMPLING LOG

Project name BNSF-Skykomish  
Project No. 60191113  
Date 9/21/11

Well No. 5-W-14  
Sampled By DWK  
weather Cloudy, 55 °F

WELL INFORMATION		
Depth to water	10.06	(ft)
Depth of well:		(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	None	(ft)
Screen interval:		
well condition:	ok	

COMMENTS
Tubing inlet at ~ 11.0'

PURGE DATA							
start purge time	0849						
time		0859	0902	0905			
DTW	(ft)	10.06					
purge rate	(L/min)	0.30					
pH	(Units)	5.14	5.12	5.09			
conductivity	(umhos/cm)	0.232	0.235	0.238			
temperature	(deg C)	8.4	8.4	8.3			
D.O.	(mg/L)	6.48	6.41	6.35			
ORP	(mv)	334	334	335			
turbidity	(NTU)	1.65	1.59	1.52			
purge and sample equip.	Peristaltic pump and silicone/polyethylene tubing						

SAMPLE INFORMATION					
sample number	time	analysis	container	# bottles	preservative
5-W-14-0911	0910	NWTPH-Dx (w/SGCU)	1L Gl. Amber	2	HCl
		NWTPH-Dx (w/o SGCU)	1L Gl. Amber	2	HCl







## **Well Decommissioning Forms**

## Well Installation Form

## AECOM ENVIRONMENT

## FIELD ACTIVITY LOG

PROJECT BNSF-SkykomishCOMPLETED BY D. KinneyJOB NO. 60191113-0550

APPROVED BY \_\_\_\_\_

DAY & DATE Thurs May 26<sup>th</sup> 2011SHEET 1 OF 1

## FIELD ACTIVITY SUBJECT:

## DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

Well Abandonment & Well Install (EW-2A)

TIME	
0715	Arrived onsite & setup for abandonment - checked on rail near MW-28, called shawver & was told rail is out of service by MW-28
0730	met Major-Drilling & had safety mtg
0755	Moving & setting up on MW-28
0845	Pulling posts & monument → total depth 19.9' (TAC) before pulling
1115	Finished backfilling MW-28 w/bentonite chips 6.5 bags (drilled to 20' w/6" & to 18.5' w/8" @)
1120	Cleaning up at MW-28 & moving to 5-W-20/-42
1215	Setup on 5-W-42 TD = 19.8' TAC PVC drilled to 20' & started backfilling well w/bentonite used 4.5' bags bentonite (4" inner, 6" @ outer casing)
1430	Filled 5-W-20 w/chips (~1/2 bag) & concreted monument
1515	Wanted look at IC-W-2; called Renee K. about location of sewer, will postpone abandonment of this well
1525	Major decommission casing & we will start on well install
1610	Started installing EW-2A
1800	Completed drilling, now doing installation
1830	Completed well install (19.5' td) & cleaning up
1930	Left site
VISITORS ON SITE: <u>None</u>	
CHANGES FROM PALNS OR IMPORTANT DECISIONS: <u>None</u>	
WEATHER CONDITIONS: <u>Raining, 45-50°F</u>	
IMPORTANT TELEPHONE CALLS: <u>Renee K → IC-W-2: sewer location</u>	
PERSONNEL ON SITE: <u>Dean Kinney (AECOM)</u> <u>Jeffrey John, Kayles Chartes (Major)</u>	

## AECOM ENVIRONMENT

## FIELD ACTIVITY LOG

PROJECT BASF - SkykomishCOMPLETED BY D. KinneyJOB NO. 60191113

APPROVED BY \_\_\_\_\_

DAY & DATE Fri May 27<sup>th</sup> 2011SHEET 1 OF 1

## FIELD ACTIVITY SUBJECT:

## DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:

well development (EW-2A) &  
well sampling (vaults)

TIME	
0730	D. Kinney arrived onsite
0740	Major Drilling onsite
0745	H-5 Mtg
0800	Setting up to do well development, Major decontamination
0821	Started purging EW-2A w/ 12V dc pump surged well initially & every ~ 5 gals
0917	Completed development - removed ~ 50 gals
0915	Major Drilling completing decon & getting ready to mob offsite, Setting up to complete vault well sampling
0930	Started vault well sampling
1120	Major Drilling offsite - continuing well development
1355	Completed all (60) sample locations & loading up to leave
1430	Left site for lab

## VISITORS ON SITE:

None

## CHANGES FROM PALNS OR IMPORTANT DECISIONS:

None

## WEATHER CONDITIONS:

Clear, 45-55°F

## IMPORTANT TELEPHONE CALLS:

None

## PERSONNEL ON SITE:

Dean Kinney (AECOM)  
Jeff John, Kaleb Charles (Major)



**AECOM Environment  
Soil Boring Log**

Boring No: 1 of 1  
Sheet 1 of 1

PROJECT: <b>BNSF-Skykomish</b>		CONTRACTOR: <b>Major</b>		MONUMENT: <b>Flush Mount</b>		CASING ID: <b>2"</b>	
PROJECT NO.: <b>60191113 -0550</b>		DRILLER: <b>Jeffrey John</b>		RISER: <b>0-4.5'</b>		SCREEN: <b>4.5-19.5'</b>	
LOCATION: <b>East end of HCC Wall</b>		RIG TYPE: <b>Geoprobe 8140LS</b>		FILTER PACK: <b>3-19.5'</b>		SEAL: <b>1-3'</b>	
TOTAL DEPTH: <b>19.5'</b>		METHOD: <b>Rotasonic</b>		GROUT:		GROUND ELEV.:	
DATE: <b>5/26/11</b>		TIME: <b>1610</b>		START FINISH: <b>1830</b>		BORING ID/OD: <b>2 1/4" / 6"</b>	
						LOGGED BY: <b>D. Kinney</b>	

Lab Sample Analysis	Sample Type	Depth Range	PID (ppm)	Blows (per 6")	Recovery (%)	USCS	Depth (ft.)	LITHOLOGIC DESCRIPTION	Graphic Log
							0	<b>0-2' Gravelly sand, Dk. Brown to BRN, dry, no odor or visible contamination</b>	
							1		
							2		
							3	<b>2-7' Gravelly sand, Dk. BRN to Blk, dry, no odor or visible contamination</b>	
							4		
							5		
							6		
							7		
							8	<b>7-9' sandy silt, gry/brn w/ gravel, moist, no odor or visible contamination</b>	
							9		
							10		
							11	<b>9-18.5' Sandy gravel w/some silt, gry/brn wet, no odor or visible contamination</b>	
							12		
							13		
							14		
							15		
							16		
							17		
							18		
							19	<b>18.5-19.5' Fine sandy silt gry/brn, wet, no odor or visible contamination</b>	
							20		

Groundwater Depth (ft.) <b>8.05'</b>	Date/Time <b>5/27/11 / 0800</b>
Comments:	



# GROUNDWATER SAMPLING LOG

Date 5/27/11

Sampled By DWR

weather °F

Depth to water	8.05	(ft)
Depth of well:	19.5	(ft)
Well diameter:	2	(in)
Feet of water:		(ft)
Product thickness:	None	(ft)
Screen interval:		
well condition:	ok	

[illegible]

start purge time	0821						
time (finish)	0912						
DTW (ft)							
purge rate (L/min)		Surged well every 5 mins					
pH (Units)							
conductivity (umhos/cm)		pumped 50 gals					
temperature (deg C)							
D.O. (mg/L)							
ORP (mv)							
turbidity (NTU)							
purge and sample equip.		Peristaltic pump and silicone/polyethylene tubing 12V pump					

[illegible]

## **Appendix B**

### **Laboratory and Data Validation Reports**

**(Note: the laboratory and data validation  
reports are provided on the attached CD-ROM.)**

November 08, 2010

Mark Havighorst  
AECOM - BNSF  
333 SW 5th Avenue, Suite 225  
Portland, OR 97204

RE: Project: BNSF-Skykomish  
Pace Project No.: 255465

Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on October 26, 2010. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,



Ronald Boquist for  
Jennifer Gross  
jennifer.gross@pacelabs.com  
Project Manager

Enclosures

cc: Sarah Albano, AECOM (BNSF)  
Paul Bianco, AECOM (BNSF)  
Renee Knecht, AECOM (BNSF)  
Denell Warren, AECOM (BNSF)

## REPORT OF LABORATORY ANALYSIS

Page 1 of 7

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## CERTIFICATIONS

Project: BNSF-Skykomish

Pace Project No.: 255465

### Washington Certification IDs

940 South Harney Street, Seattle, WA 98108

Alaska CS Certification #: UST-025

Alaska Drinking Water VOC Certification #: WA01230

Alaska Drinking Water Micro Certification #: WA01230

California Certification #: 01153CA

Florida/NELAP Certification #: E87617

Oregon Certification #: WA200007

Washington Certification #: C1229

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## REPORT OF LABORATORY ANALYSIS

Page 2 of 7

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## SAMPLE ANALYTE COUNT

Project: BNSF-Skykomish

Pace Project No.: 255465

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
255465001	IC-W-1-1010	NWTPH-Dx	DMT	4	PASI-S
255465002	IC-W-8-1010	NWTPH-Dx	DMT	4	PASI-S
255465003	IC-W-80-1010	NWTPH-Dx	DMT	4	PASI-S
255465004	IC-W-7-1010	NWTPH-Dx	DMT	4	PASI-S

## REPORT OF LABORATORY ANALYSIS

Page 3 of 7

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 255465

<b>Sample: IC-W-1-1010</b>		<b>Lab ID: 255465001</b>	Collected: 10/26/10 10:55	Received: 10/26/10 15:47	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.037</b>	mg/L	0.019	1	11/03/10 16:15	11/05/10 13:55		
Motor Oil Range	ND	mg/L	0.094	1	11/03/10 16:15	11/05/10 13:55	64742-65-0	
n-Octacosane (S)	85 %		50-150	1	11/03/10 16:15	11/05/10 13:55	630-02-4	
o-Terphenyl (S)	73 %		50-150	1	11/03/10 16:15	11/05/10 13:55	84-15-1	

<b>Sample: IC-W-8-1010</b>		<b>Lab ID: 255465002</b>	Collected: 10/26/10 11:40	Received: 10/26/10 15:47	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>2.2</b>	mg/L	0.019	1	11/03/10 16:15	11/05/10 14:42		
Motor Oil Range	<b>0.84</b>	mg/L	0.094	1	11/03/10 16:15	11/05/10 14:42	64742-65-0	
n-Octacosane (S)	81 %		50-150	1	11/03/10 16:15	11/05/10 14:42	630-02-4	
o-Terphenyl (S)	60 %		50-150	1	11/03/10 16:15	11/05/10 14:42	84-15-1	

<b>Sample: IC-W-80-1010</b>		<b>Lab ID: 255465003</b>	Collected: 10/26/10 12:20	Received: 10/26/10 15:47	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>2.1</b>	mg/L	0.019	1	11/03/10 16:15	11/05/10 15:28		
Motor Oil Range	<b>0.83</b>	mg/L	0.094	1	11/03/10 16:15	11/05/10 15:28	64742-65-0	
n-Octacosane (S)	80 %		50-150	1	11/03/10 16:15	11/05/10 15:28	630-02-4	
o-Terphenyl (S)	59 %		50-150	1	11/03/10 16:15	11/05/10 15:28	84-15-1	

<b>Sample: IC-W-7-1010</b>		<b>Lab ID: 255465004</b>	Collected: 10/26/10 12:45	Received: 10/26/10 15:47	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.099</b>	mg/L	0.019	1	11/03/10 16:15	11/05/10 14:18		
Motor Oil Range	ND	mg/L	0.094	1	11/03/10 16:15	11/05/10 14:18	64742-65-0	
n-Octacosane (S)	80 %		50-150	1	11/03/10 16:15	11/05/10 14:18	630-02-4	
o-Terphenyl (S)	79 %		50-150	1	11/03/10 16:15	11/05/10 14:18	84-15-1	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 255465

QC Batch: OEXT/2914

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 255465001, 255465002, 255465003, 255465004

METHOD BLANK: 47952

Matrix: Water

Associated Lab Samples: 255465001, 255465002, 255465003, 255465004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	11/05/10 12:45	
Motor Oil Range	mg/L	ND	0.10	11/05/10 12:45	
n-Octacosane (S)	%	93	50-150	11/05/10 12:45	
o-Terphenyl (S)	%	83	50-150	11/05/10 12:45	

LABORATORY CONTROL SAMPLE & LCSD: 47953

47954

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Diesel Range	mg/L	1.2	0.96	0.99	77	79	51-147	3	30	
Motor Oil Range	mg/L	1.2	1.1	1.1	87	90	20-160	4	30	
n-Octacosane (S)	%				89	93	50-150			
o-Terphenyl (S)	%				95	96	50-150			

## QUALIFIERS

Project: BNSF-Skykomish

Pace Project No.: 255465

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-S Pace Analytical Services - Seattle

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF-Skykomish

Pace Project No.: 255465

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
255465001	IC-W-1-1010	EPA 3510	OEXT/2914	NWTPH-Dx	GCSV/2042
255465002	IC-W-8-1010	EPA 3510	OEXT/2914	NWTPH-Dx	GCSV/2042
255465003	IC-W-80-1010	EPA 3510	OEXT/2914	NWTPH-Dx	GCSV/2042
255465004	IC-W-7-1010	EPA 3510	OEXT/2914	NWTPH-Dx	GCSV/2042



# Sample Condition Upon Receipt

Client Name: Aecom

Project # 255465

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace Other \_\_\_\_\_

Tracking #: \_\_\_\_\_

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No Seals intact: ☐ Yes ☐ No

Packing Material: ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other \_\_\_\_\_ Temp. Blank Yes ☒ No

Thermometer Used 132013 or 101731962 or 226099 Type of Ice: ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temperature 5.7

Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: NJS 10/26/10

Temp should be above freezing  $\leq 6^{\circ}\text{C}$

Comments:

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>water</u>		
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G		Initial when completed
		Lot # of added preservative
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blanks Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review:

JENNI GRASS

Date: 10/27/10

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



255465

Section A		Section B		Section C	
Required Client Information:		Required Project Information:		Invoice Information:	
Company:	AECOM	Report To:	Rance Knecht, Sarah Albano	Attention:	
Address:	710 2nd Ave. Suite 1000	Copy To:	Dean Kinney	Company Name:	
	Seattle WA, 98104			Address:	
Email To:	Sarah.albano@aecom.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	206-624-9344	Project Name:	SKYCOM: SN BNSF	Pace Project Manager:	
Requested Due Date/AT:	Standard	Project Number:	61054595-0540	Pace Profile #:	
				REGULATORY AGENCY	
				NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER	
				UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER <input type="checkbox"/>	
Site Location				STATE: WA	
				1391119	

[illegible]

# Sample Container Count

CLIENT:

Accom

NO# 255465



COC PAGE 1 of 1  
COC ID# 1391119

Sample Line	Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WG9U	WG1U	Comments
1			2										
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													Trip Blank? N.

AG1H	1 liter HCL amber glass												
AG1U	1 liter unpreserved amber glass												JG9U 4oz unpreserved amber wide
AG2S	500mL H2SO4 amber glass												R terra core kit
AG2U	500mL unpreserved amber glass												U Summa Can
AG3S	250mL H2SO4 amber glass												VG9H 40mL HCL clear vial
BG1H	1 liter HCL clear glass												VG9T 40mL Na Thio. clear vial
BG1U	1 liter unpreserved glass												VG9U 40mL unpreserved clear vial
BP1N	1 liter HNO3 plastic												VG9W 40mL glass vial preweighted (EPA 5035)
BP1S	1 liter H2SO4 plastic												VSG Headspace septa vial & HCL
BP1U	1 liter unpreserved plastic												WG9U 4oz clear soil jar
BP1Z	1 liter NaOH, Zn, Ac												WGFX 4oz wide jar w/hexane wipe
BP2N	500mL HNO3 plastic												ZPLC Ziploc Bag
BP2O	500mL NaOH plastic												

December 13, 2010

Mark Havighorst  
AECOM - BNSF  
333 SW 5th Avenue, Suite 225  
Portland, OR 97204

RE: Project: BNSF Skykomish  
Pace Project No.: 255839

Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on November 30, 2010. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,



Melanie Miller

melanie.miller@pacelabs.com  
Project Manager

Enclosures

cc: Sarah Albano, AECOM (BNSF)  
Paul Bianco, AECOM (BNSF)  
Renee Knecht, AECOM (BNSF)  
Denell Warren, AECOM (BNSF)

## REPORT OF LABORATORY ANALYSIS

Page 1 of 8

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## CERTIFICATIONS

Project: BNSF Skykomish

Pace Project No.: 255839

### Washington Certification IDs

940 South Harney Street, Seattle, WA 98108

Alaska CS Certification #: UST-025

Alaska Drinking Water VOC Certification #: WA01230

Alaska Drinking Water Micro Certification #: WA01230

California Certification #: 01153CA

Florida/NELAP Certification #: E87617

Oregon Certification #: WA200007

Washington Certification #: C1229

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## REPORT OF LABORATORY ANALYSIS

Page 2 of 8

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## SAMPLE ANALYTE COUNT

Project: BNSF Skykomish

Pace Project No.: 255839

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
255839001	IC-W-1-1110	NWTPH-Dx	ERB	4	PASI-S
255839002	IC-W-8-1110	NWTPH-Dx	ERB	4	PASI-S
255839003	IC-W-80-1110	NWTPH-Dx	ERB	4	PASI-S
255839004	IC-W-7-1110	NWTPH-Dx	ERB	4	PASI-S

## REPORT OF LABORATORY ANALYSIS

Page 3 of 8

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## ANALYTICAL RESULTS

Project: BNSF Skykomish  
Pace Project No.: 255839

<b>Sample: IC-W-1-1110</b>		<b>Lab ID: 255839001</b>	Collected: 11/30/10 11:55	Received: 11/30/10 17:27	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.044</b>	mg/L	0.019	1	12/07/10 14:20	12/08/10 06:28		
Motor Oil Range	ND	mg/L	0.094	1	12/07/10 14:20	12/08/10 06:28	64742-65-0	
n-Octacosane (S)	57	%	50-150	1	12/07/10 14:20	12/08/10 06:28	630-02-4	
o-Terphenyl (S)	50	%	50-150	1	12/07/10 14:20	12/08/10 06:28	84-15-1	P2

<b>Sample: IC-W-8-1110</b>		<b>Lab ID: 255839002</b>	Collected: 11/30/10 12:40	Received: 11/30/10 17:27	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.28</b>	mg/L	0.019	1	12/08/10 15:10	12/09/10 16:15		
Motor Oil Range	<b>0.13</b>	mg/L	0.094	1	12/08/10 15:10	12/09/10 16:15	64742-65-0	
n-Octacosane (S)	103	%	50-150	1	12/08/10 15:10	12/09/10 16:15	630-02-4	
o-Terphenyl (S)	87	%	50-150	1	12/08/10 15:10	12/09/10 16:15	84-15-1	

<b>Sample: IC-W-80-1110</b>		<b>Lab ID: 255839003</b>	Collected: 11/30/10 13:00	Received: 11/30/10 17:27	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.26</b>	mg/L	0.019	1	12/08/10 15:10	12/09/10 16:32		
Motor Oil Range	<b>0.14</b>	mg/L	0.094	1	12/08/10 15:10	12/09/10 16:32	64742-65-0	
n-Octacosane (S)	100	%	50-150	1	12/08/10 15:10	12/09/10 16:32	630-02-4	
o-Terphenyl (S)	85	%	50-150	1	12/08/10 15:10	12/09/10 16:32	84-15-1	

<b>Sample: IC-W-7-1110</b>		<b>Lab ID: 255839004</b>	Collected: 11/30/10 14:15	Received: 11/30/10 17:27	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.098</b>	mg/L	0.019	1	12/08/10 15:10	12/09/10 16:48		
Motor Oil Range	ND	mg/L	0.094	1	12/08/10 15:10	12/09/10 16:48	64742-65-0	
n-Octacosane (S)	104	%	50-150	1	12/08/10 15:10	12/09/10 16:48	630-02-4	
o-Terphenyl (S)	89	%	50-150	1	12/08/10 15:10	12/09/10 16:48	84-15-1	

## QUALITY CONTROL DATA

Project: BNSF Skykomish

Pace Project No.: 255839

QC Batch: OEXT/3066

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 255839001

METHOD BLANK: 51445

Matrix: Water

Associated Lab Samples: 255839001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	12/08/10 05:05	
Motor Oil Range	mg/L	ND	0.10	12/08/10 05:05	
n-Octacosane (S)	%	73	50-150	12/08/10 05:05	
o-Terphenyl (S)	%	58	50-150	12/08/10 05:05	

LABORATORY CONTROL SAMPLE: 51446

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	0.50	40	51-147	L2
Motor Oil Range	mg/L	1.2	0.70	56	20-160	
n-Octacosane (S)	%			56	50-150	
o-Terphenyl (S)	%			59	50-150	

SAMPLE DUPLICATE: 51447

Parameter	Units	255839001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.044	0.052	17	
Motor Oil Range	mg/L	ND	.06J		
n-Octacosane (S)	%	57	92	48	
o-Terphenyl (S)	%	50	82	49	

## QUALITY CONTROL DATA

Project: BNSF Skykomish

Pace Project No.: 255839

QC Batch: OEXT/3077

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 255839002, 255839003, 255839004

METHOD BLANK: 51811

Matrix: Water

Associated Lab Samples: 255839002, 255839003, 255839004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	12/09/10 14:19	
Motor Oil Range	mg/L	ND	0.10	12/09/10 14:19	
n-Octacosane (S)	%	98	50-150	12/09/10 14:19	
o-Terphenyl (S)	%	82	50-150	12/09/10 14:19	

LABORATORY CONTROL SAMPLE: 51812

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	1.0	80	51-147	
Motor Oil Range	mg/L	1.2	1.3	107	20-160	
n-Octacosane (S)	%			94	50-150	
o-Terphenyl (S)	%			101	50-150	

## QUALIFIERS

Project: BNSF Skykomish

Pace Project No.: 255839

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-S Pace Analytical Services - Seattle

### BATCH QUALIFIERS

Batch: GCSV/2135

[1] A sample duplicate was not performed for this batch due to insufficient sample volume.

### ANALYTE QUALIFIERS

L2 Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.

P2 Re-extraction or re-analysis could not be performed due to insufficient sample amount.

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF Skykomish

Pace Project No.: 255839

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
255839001	IC-W-1-1110	EPA 3510	OEXT/3066	NWTPH-Dx	GCSV/2128
255839002	IC-W-8-1110	EPA 3510	OEXT/3077	NWTPH-Dx	GCSV/2135
255839003	IC-W-80-1110	EPA 3510	OEXT/3077	NWTPH-Dx	GCSV/2135
255839004	IC-W-7-1110	EPA 3510	OEXT/3077	NWTPH-Dx	GCSV/2135



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

255839

## Section A

Required Client Information:

Company: **AECOM**  
Address: **710 2nd Ave.**  
**Suite 1000 Seattle, WA 98104**  
Email To: **Sarah.albano@aecom.com**  
Phone: **206-624-9349**  
Requested Due Date/TAT: **Standard**

## Section B

Required Project Information:

Report To: **Sarah Albano**  
Copy To: **Renee Knecht**  
Purchase Order No.: **P**  
Project Name: **BNSF SKYKOMISH**  
Project Number: **60154595-0540**

## Section C

Invoice Information:

Attention: **Bruce Sheppard**  
Company Name: **BNSF**  
Address:  
Pace Quote Reference:  
Pace Project Manager:  
Pace Profile #:

Page: 1 of 1

1338247

## REGULATORY AGENCY

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER  
☐ UST ☐ RCRA ☐ OTHER

Site Location

STATE: **WA**

## Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	Matrix Codes Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Tissue TS Other OT	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analysis Test ↓	Y/N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											</
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ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Abdullah Albano AECOM	11/30/10	1727	Jyothi Swamy	11/30/10	1727	1.3	4	4	4

ORIGINAL

## SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: **Abdullah Albano**

SIGNATURE of SAMPLER: **Abdullah Albano**

DATE Signed  
(MM/DD/YY):

**11/30/10**

Temp in °C  
Received on  
Ice (Y/N)  
Custody  
Sealed Cooler  
(Y/N)  
Samples Intact  
(Y/N)

# Sample Container Count

CLIENT:

AECOM



255839

COC PAGE 1 of 1  
COC ID# 1338247

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU				Comments
1		2													
2		↓													
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFU	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		





# Sample Condition Upon Receipt

Client Name: AECOM

Project # 255839

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace Other \_\_\_\_\_

Tracking #: \_\_\_\_\_

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No Seals intact: ☐ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other \_\_\_\_\_ Temp. Blank ☒ Yes ☐ No

Thermometer Used 132013 or 101731952 or 226099 Type of Ice: ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temperature 1.3°C Biological Tissue is Frozen: Yes No

Temp should be above freezing  $\leq 6^{\circ}\text{C}$

Comments:

Date and Initials of person examining contents: NSS 11/30/10

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix:	<u>water</u>	
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G		
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blanks Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: [Signature]

Date: 12/1/10

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

December 30, 2010

Mark Havighorst  
AECOM - BNSF  
333 SW 5th Avenue, Suite 225  
Portland, OR 97204

RE: Project: BNSF-Skykomish  
Pace Project No.: 256063

Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on December 16, 2010. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,



Melanie Miller

melanie.miller@pacelabs.com  
Project Manager

Enclosures

cc: Sarah Albano, AECOM (BNSF)  
Paul Bianco, AECOM (BNSF)  
Renee Knecht, AECOM (BNSF)  
Jennifer Wald, AECOM (BNSF)

## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: BNSF-Skykomish

Pace Project No.: 256063

### Washington Certification IDs

940 South Harney Street, Seattle, WA 98108

Alaska CS Certification #: UST-025

Alaska Drinking Water VOC Certification #: WA01230

Alaska Drinking Water Micro Certification #: WA01230

California Certification #: 01153CA

Florida/NELAP Certification #: E87617

Oregon Certification #: WA200007

Washington Certification #: C1229

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE ANALYTE COUNT

Project: BNSF-Skykomish

Pace Project No.: 256063

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
256063001	1C-W-7-1210	NWTPH-Dx	AY1	4	PASI-S
256063002	1C-W-1-1210	NWTPH-Dx	AY1	4	PASI-S
256063003	1C-W-8-1210	NWTPH-Dx	AY1	4	PASI-S
256063004	2B-W-4-1210	NWTPH-Dx	AY1	4	PASI-S
256063005	2A-W-40-1210	NWTPH-Dx	AY1	4	PASI-S
256063006	5-W-43-1210	NWTPH-Dx	AY1	4	PASI-S
256063007	2A-W-9-1210	NWTPH-Dx	AY1	4	PASI-S
256063008	2A-W-10-1210	NWTPH-Dx	AY1	4	PASI-S
256063009	MW-4-1210	NWTPH-Dx	AY1	4	PASI-S
256063010	MW-3-1210	NWTPH-Dx	AY1	4	PASI-S
256063011	MW-30-1210	NWTPH-Dx	AY1	4	PASI-S
256063012	GW-1-1210	NWTPH-Dx	AY1	4	PASI-S
256063013	2A-W-42-1210	NWTPH-Dx	AY1	4	PASI-S
256063014	5-W-20-1210	NWTPH-Dx	AY1	8	PASI-S
256063015	5-W-42-1210	NWTPH-Dx	AY1	8	PASI-S
256063016	5-W-18-1210	NWTPH-Dx	AY1	8	PASI-S
256063017	EW-1-1210	NWTPH-Dx	AY1	4	PASI-S
256063018	GW-2-1210	NWTPH-Dx	AY1	4	PASI-S
256063019	GW-20-1210	NWTPH-Dx	AY1	4	PASI-S
256063020	2A-W-41-1210	NWTPH-Dx	AY1	4	PASI-S
256063021	GW-3-1210	NWTPH-Dx	AY1	4	PASI-S
256063022	1B-W-23-1210	NWTPH-Dx	AY1	4	PASI-S
256063023	GW-4-1210	NWTPH-Dx	AY1	4	PASI-S
256063024	5-W-19-1210	NWTPH-Dx	AY1	8	PASI-S
256063025	5-W-16-1210	NWTPH-Dx	AY1	8	PASI-S
256063026	5-W-14-1210	NWTPH-Dx	AY1	8	PASI-S
256063027	5-W-17-1210	NWTPH-Dx	AY1	8	PASI-S
256063028	5-W-15-1210	NWTPH-Dx	AY1	8	PASI-S
256063029	5-W-150-1210	NWTPH-Dx	AY1	8	PASI-S

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 256063

<b>Sample: 1C-W-7-1210</b>		<b>Lab ID: 256063001</b>	Collected: 12/14/10 14:20		Received: 12/16/10 14:20		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.66	mg/L	0.020	1	12/23/10 09:15	12/23/10 14:42		
Motor Oil Range	0.13	mg/L	0.099	1	12/23/10 09:15	12/23/10 14:42	64742-65-0	
n-Octacosane (S)	101	%	50-150	1	12/23/10 09:15	12/23/10 14:42	630-02-4	
o-Terphenyl (S)	91	%	50-150	1	12/23/10 09:15	12/23/10 14:42	84-15-1	

<b>Sample: 1C-W-1-1210</b>		<b>Lab ID: 256063002</b>	Collected: 12/14/10 14:15		Received: 12/16/10 14:20		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.042	mg/L	0.019	1	12/23/10 09:15	12/23/10 15:15		
Motor Oil Range	ND	mg/L	0.095	1	12/23/10 09:15	12/23/10 15:15	64742-65-0	
n-Octacosane (S)	74	%	50-150	1	12/23/10 09:15	12/23/10 15:15	630-02-4	
o-Terphenyl (S)	67	%	50-150	1	12/23/10 09:15	12/23/10 15:15	84-15-1	

<b>Sample: 1C-W-8-1210</b>		<b>Lab ID: 256063003</b>	Collected: 12/14/10 14:45		Received: 12/16/10 14:20		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.42	mg/L	0.019	1	12/23/10 09:15	12/23/10 15:31		
Motor Oil Range	0.19	mg/L	0.095	1	12/23/10 09:15	12/23/10 15:31	64742-65-0	
n-Octacosane (S)	88	%	50-150	1	12/23/10 09:15	12/23/10 15:31	630-02-4	
o-Terphenyl (S)	78	%	50-150	1	12/23/10 09:15	12/23/10 15:31	84-15-1	

<b>Sample: 2B-W-4-1210</b>		<b>Lab ID: 256063004</b>	Collected: 12/14/10 15:25		Received: 12/16/10 14:20		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.020	1	12/23/10 09:15	12/23/10 15:48		
Motor Oil Range	ND	mg/L	0.099	1	12/23/10 09:15	12/23/10 15:48	64742-65-0	
n-Octacosane (S)	88	%	50-150	1	12/23/10 09:15	12/23/10 15:48	630-02-4	
o-Terphenyl (S)	63	%	50-150	1	12/23/10 09:15	12/23/10 15:48	84-15-1	

<b>Sample: 2A-W-40-1210</b>		<b>Lab ID: 256063005</b>	Collected: 12/14/10 16:20		Received: 12/16/10 14:20		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.050	mg/L	0.021	1	12/23/10 09:15	12/23/10 16:05		
Motor Oil Range	ND	mg/L	0.10	1	12/23/10 09:15	12/23/10 16:05	64742-65-0	

Date: 12/30/2010 11:51 AM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 256063

<b>Sample: 2A-W-40-1210</b>	<b>Lab ID: 256063005</b>	Collected: 12/14/10 16:20	Received: 12/16/10 14:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

n-Octacosane (S)	88 %		50-150	1	12/23/10 09:15	12/23/10 16:05	630-02-4	
o-Terphenyl (S)	74 %		50-150	1	12/23/10 09:15	12/23/10 16:05	84-15-1	

<b>Sample: 5-W-43-1210</b>	<b>Lab ID: 256063006</b>	Collected: 12/14/10 16:30	Received: 12/16/10 14:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.030 mg/L		0.019	1	12/23/10 09:15	12/23/10 16:54		
Motor Oil Range	ND mg/L		0.095	1	12/23/10 09:15	12/23/10 16:54	64742-65-0	
n-Octacosane (S)	84 %		50-150	1	12/23/10 09:15	12/23/10 16:54	630-02-4	
o-Terphenyl (S)	71 %		50-150	1	12/23/10 09:15	12/23/10 16:54	84-15-1	

<b>Sample: 2A-W-9-1210</b>	<b>Lab ID: 256063007</b>	Collected: 12/15/10 08:50	Received: 12/16/10 14:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.39 mg/L		0.019	1	12/23/10 09:15	12/23/10 17:11		
Motor Oil Range	0.18 mg/L		0.095	1	12/23/10 09:15	12/23/10 17:11	64742-65-0	
n-Octacosane (S)	81 %		50-150	1	12/23/10 09:15	12/23/10 17:11	630-02-4	
o-Terphenyl (S)	73 %		50-150	1	12/23/10 09:15	12/23/10 17:11	84-15-1	

<b>Sample: 2A-W-10-1210</b>	<b>Lab ID: 256063008</b>	Collected: 12/15/10 09:35	Received: 12/16/10 14:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.13 mg/L		0.019	1	12/23/10 09:15	12/23/10 17:28		
Motor Oil Range	0.32 mg/L		0.095	1	12/23/10 09:15	12/23/10 17:28	64742-65-0	
n-Octacosane (S)	73 %		50-150	1	12/23/10 09:15	12/23/10 17:28	630-02-4	
o-Terphenyl (S)	70 %		50-150	1	12/23/10 09:15	12/23/10 17:28	84-15-1	

<b>Sample: MW-4-1210</b>	<b>Lab ID: 256063009</b>	Collected: 12/15/10 10:15	Received: 12/16/10 14:20	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.051 mg/L		0.019	1	12/23/10 09:15	12/23/10 17:44		
Motor Oil Range	ND mg/L		0.095	1	12/23/10 09:15	12/23/10 17:44	64742-65-0	
n-Octacosane (S)	78 %		50-150	1	12/23/10 09:15	12/23/10 17:44	630-02-4	
o-Terphenyl (S)	74 %		50-150	1	12/23/10 09:15	12/23/10 17:44	84-15-1	

Date: 12/30/2010 11:51 AM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 256063

Sample: MW-3-1210		Lab ID: 256063010		Collected: 12/15/10 11:00		Received: 12/16/10 14:20		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.049	mg/L	0.019	1	12/23/10 09:15	12/23/10 18:01		
Motor Oil Range		ND	mg/L	0.095	1	12/23/10 09:15	12/23/10 18:01	64742-65-0	
n-Octacosane (S)		76	%	50-150	1	12/23/10 09:15	12/23/10 18:01	630-02-4	
o-Terphenyl (S)		71	%	50-150	1	12/23/10 09:15	12/23/10 18:01	84-15-1	

Sample: MW-30-1210		Lab ID: 256063011		Collected: 12/15/10 11:15		Received: 12/16/10 14:20		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.057	mg/L	0.019	1	12/23/10 09:15	12/23/10 18:17		
Motor Oil Range		ND	mg/L	0.095	1	12/23/10 09:15	12/23/10 18:17	64742-65-0	
n-Octacosane (S)		80	%	50-150	1	12/23/10 09:15	12/23/10 18:17	630-02-4	
o-Terphenyl (S)		76	%	50-150	1	12/23/10 09:15	12/23/10 18:17	84-15-1	

Sample: GW-1-1210		Lab ID: 256063012		Collected: 12/15/10 12:50		Received: 12/16/10 14:20		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.059	mg/L	0.019	1	12/23/10 09:15	12/23/10 18:51		
Motor Oil Range		ND	mg/L	0.095	1	12/23/10 09:15	12/23/10 18:51	64742-65-0	
n-Octacosane (S)		74	%	50-150	1	12/23/10 09:15	12/23/10 18:51	630-02-4	
o-Terphenyl (S)		67	%	50-150	1	12/23/10 09:15	12/23/10 18:51	84-15-1	

Sample: 2A-W-42-1210		Lab ID: 256063013		Collected: 12/15/10 14:00		Received: 12/16/10 14:20		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.20 mg/L		0.019	1	12/28/10 10:10	12/28/10 22:58		
Motor Oil Range		0.18 mg/L		0.095	1	12/28/10 10:10	12/28/10 22:58	64742-65-0	
n-Octacosane (S)		89 %		50-150	1	12/28/10 10:10	12/28/10 22:58	630-02-4	
o-Terphenyl (S)		84 %		50-150	1	12/28/10 10:10	12/28/10 22:58	84-15-1	

Sample: 5-W-20-1210		Lab ID: 256063014		Collected: 12/15/10 14:35		Received: 12/16/10 14:20		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS SG		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.25	mg/L	0.019	1	12/23/10 09:15	12/23/10 19:57		
Diesel Range SG		ND	mg/L	0.019	1	12/23/10 11:35	12/23/10 23:16		

Date: 12/30/2010 11:51 AM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 256063

<b>Sample: 5-W-20-1210</b>		<b>Lab ID: 256063014</b>	Collected: 12/15/10 14:35		Received: 12/16/10 14:20		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS SG</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Motor Oil Range	0.18	mg/L	0.095	1	12/23/10 09:15	12/23/10 19:57	64742-65-0	
Motor Oil Range SG	ND	mg/L	0.095	1	12/23/10 11:35	12/23/10 23:16	64742-65-0	
n-Octacosane (S) SG	94	%	50-150	1	12/23/10 11:35	12/23/10 23:16	630-02-4	
o-Terphenyl (S) SG	87	%	50-150	1	12/23/10 11:35	12/23/10 23:16	84-15-1	
n-Octacosane (S)	74	%	50-150	1	12/23/10 09:15	12/23/10 19:57	630-02-4	
o-Terphenyl (S)	67	%	50-150	1	12/23/10 09:15	12/23/10 19:57	84-15-1	

<b>Sample: 5-W-42-1210</b>		<b>Lab ID: 256063015</b>	Collected: 12/15/10 15:30		Received: 12/16/10 14:20		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS SG</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.11	mg/L	0.019	1	12/23/10 09:15	12/23/10 20:14		
Diesel Range SG	ND	mg/L	0.019	1	12/23/10 11:35	12/23/10 23:49		
Motor Oil Range	ND	mg/L	0.095	1	12/23/10 09:15	12/23/10 20:14	64742-65-0	
Motor Oil Range SG	ND	mg/L	0.095	1	12/23/10 11:35	12/23/10 23:49	64742-65-0	
n-Octacosane (S) SG	94	%	50-150	1	12/23/10 11:35	12/23/10 23:49	630-02-4	
o-Terphenyl (S) SG	86	%	50-150	1	12/23/10 11:35	12/23/10 23:49	84-15-1	
n-Octacosane (S)	77	%	50-150	1	12/23/10 09:15	12/23/10 20:14	630-02-4	
o-Terphenyl (S)	68	%	50-150	1	12/23/10 09:15	12/23/10 20:14	84-15-1	

<b>Sample: 5-W-18-1210</b>		<b>Lab ID: 256063016</b>	Collected: 12/15/10 16:10		Received: 12/16/10 14:20		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS SG</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.16	mg/L	0.019	1	12/23/10 09:15	12/23/10 20:30		
Diesel Range SG	0.033	mg/L	0.019	1	12/23/10 11:35	12/24/10 00:06		
Motor Oil Range	0.11	mg/L	0.095	1	12/23/10 09:15	12/23/10 20:30	64742-65-0	
Motor Oil Range SG	ND	mg/L	0.095	1	12/23/10 11:35	12/24/10 00:06	64742-65-0	
n-Octacosane (S) SG	95	%	50-150	1	12/23/10 11:35	12/24/10 00:06	630-02-4	
o-Terphenyl (S) SG	88	%	50-150	1	12/23/10 11:35	12/24/10 00:06	84-15-1	
n-Octacosane (S)	79	%	50-150	1	12/23/10 09:15	12/23/10 20:30	630-02-4	
o-Terphenyl (S)	68	%	50-150	1	12/23/10 09:15	12/23/10 20:30	84-15-1	

<b>Sample: EW-1-1210</b>		<b>Lab ID: 256063017</b>	Collected: 12/15/10 09:35		Received: 12/16/10 14:20		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.046	mg/L	0.020	1	12/23/10 09:15	12/23/10 20:47		
Motor Oil Range	ND	mg/L	0.10	1	12/23/10 09:15	12/23/10 20:47	64742-65-0	
n-Octacosane (S)	77	%	50-150	1	12/23/10 09:15	12/23/10 20:47	630-02-4	



## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 256063

<b>Sample: EW-1-1210</b>		<b>Lab ID: 256063017</b>	Collected: 12/15/10 09:35	Received: 12/16/10 14:20	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

o-Terphenyl (S)	69 %	50-150	1	12/23/10 09:15	12/23/10 20:47	84-15-1
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<b>Sample: GW-2-1210</b>		<b>Lab ID: 256063018</b>	Collected: 12/15/10 11:15	Received: 12/16/10 14:20	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.045 mg/L	0.020	1	12/23/10 09:15	12/23/10 21:03	
Motor Oil Range	ND mg/L	0.10	1	12/23/10 09:15	12/23/10 21:03	64742-65-0
n-Octacosane (S)	79 %	50-150	1	12/23/10 09:15	12/23/10 21:03	630-02-4
o-Terphenyl (S)	66 %	50-150	1	12/23/10 09:15	12/23/10 21:03	84-15-1

<b>Sample: GW-20-1210</b>		<b>Lab ID: 256063019</b>	Collected: 12/15/10 10:15	Received: 12/16/10 14:20	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.049 mg/L	0.020	1	12/23/10 09:15	12/23/10 21:20	
Motor Oil Range	ND mg/L	0.10	1	12/23/10 09:15	12/23/10 21:20	64742-65-0
n-Octacosane (S)	79 %	50-150	1	12/23/10 09:15	12/23/10 21:20	630-02-4
o-Terphenyl (S)	67 %	50-150	1	12/23/10 09:15	12/23/10 21:20	84-15-1

<b>Sample: 2A-W-41-1210</b>		<b>Lab ID: 256063020</b>	Collected: 12/15/10 13:00	Received: 12/16/10 14:20	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.13 mg/L	0.020	1	12/23/10 09:15	12/23/10 21:37	
Motor Oil Range	ND mg/L	0.10	1	12/23/10 09:15	12/23/10 21:37	64742-65-0
n-Octacosane (S)	72 %	50-150	1	12/23/10 09:15	12/23/10 21:37	630-02-4
o-Terphenyl (S)	61 %	50-150	1	12/23/10 09:15	12/23/10 21:37	84-15-1

<b>Sample: GW-3-1210</b>		<b>Lab ID: 256063021</b>	Collected: 12/15/10 13:55	Received: 12/16/10 14:20	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.032 mg/L	0.020	1	12/28/10 10:10	12/28/10 19:38	
Motor Oil Range	ND mg/L	0.10	1	12/28/10 10:10	12/28/10 19:38	64742-65-0
n-Octacosane (S)	90 %	50-150	1	12/28/10 10:10	12/28/10 19:38	630-02-4
o-Terphenyl (S)	73 %	50-150	1	12/28/10 10:10	12/28/10 19:38	84-15-1

## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 256063

Sample: 1B-W-23-1210		Lab ID: 256063022	Collected: 12/15/10 15:20	Received: 12/16/10 14:20	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND mg/L		0.020	1	12/28/10 10:10	12/28/10 20:11		
Motor Oil Range	ND mg/L		0.10	1	12/28/10 10:10	12/28/10 20:11	64742-65-0	
n-Octacosane (S)	88 %		50-150	1	12/28/10 10:10	12/28/10 20:11	630-02-4	
o-Terphenyl (S)	78 %		50-150	1	12/28/10 10:10	12/28/10 20:11	84-15-1	

Sample: GW-4-1210		Lab ID: 256063023	Collected: 12/15/10 16:15	Received: 12/16/10 14:20	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.066 mg/L		0.020	1	12/28/10 10:10	12/28/10 21:01		
Motor Oil Range	ND mg/L		0.098	1	12/28/10 10:10	12/28/10 21:01	64742-65-0	
n-Octacosane (S)	88 %		50-150	1	12/28/10 10:10	12/28/10 21:01	630-02-4	
o-Terphenyl (S)	81 %		50-150	1	12/28/10 10:10	12/28/10 21:01	84-15-1	

Sample: 5-W-19-1210		Lab ID: 256063024	Collected: 12/16/10 08:50	Received: 12/16/10 14:20	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS SG</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND mg/L		0.021	1	12/28/10 10:10	12/28/10 21:18		
Diesel Range SG	ND mg/L		0.020	1	12/23/10 11:35	12/24/10 00:23		
Motor Oil Range	ND mg/L		0.10	1	12/28/10 10:10	12/28/10 21:18	64742-65-0	
Motor Oil Range SG	ND mg/L		0.099	1	12/23/10 11:35	12/24/10 00:23	64742-65-0	
n-Octacosane (S) SG	93 %		50-150	1	12/23/10 11:35	12/24/10 00:23	630-02-4	
o-Terphenyl (S) SG	86 %		50-150	1	12/23/10 11:35	12/24/10 00:23	84-15-1	
n-Octacosane (S)	87 %		50-150	1	12/28/10 10:10	12/28/10 21:18	630-02-4	
o-Terphenyl (S)	76 %		50-150	1	12/28/10 10:10	12/28/10 21:18	84-15-1	

Sample: 5-W-16-1210		Lab ID: 256063025	Collected: 12/16/10 09:30	Received: 12/16/10 14:20	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS SG</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.10 mg/L		0.019	1	12/28/10 10:10	12/28/10 21:35		
Diesel Range SG	ND mg/L		0.019	1	12/23/10 11:35	12/24/10 00:39		
Motor Oil Range	ND mg/L		0.095	1	12/28/10 10:10	12/28/10 21:35	64742-65-0	
Motor Oil Range SG	ND mg/L		0.095	1	12/23/10 11:35	12/24/10 00:39	64742-65-0	
n-Octacosane (S) SG	101 %		50-150	1	12/23/10 11:35	12/24/10 00:39	630-02-4	
o-Terphenyl (S) SG	91 %		50-150	1	12/23/10 11:35	12/24/10 00:39	84-15-1	
n-Octacosane (S)	85 %		50-150	1	12/28/10 10:10	12/28/10 21:35	630-02-4	
o-Terphenyl (S)	77 %		50-150	1	12/28/10 10:10	12/28/10 21:35	84-15-1	

## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 256063

<b>Sample: 5-W-14-1210</b>		<b>Lab ID: 256063026</b>	Collected: 12/16/10 09:45	Received: 12/16/10 14:20	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS SG</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.020	1	12/28/10 10:10	12/28/10 21:51		
Diesel Range SG	ND	mg/L	0.021	1	12/23/10 11:35	12/24/10 00:56		
Motor Oil Range	ND	mg/L	0.10	1	12/28/10 10:10	12/28/10 21:51	64742-65-0	
Motor Oil Range SG	ND	mg/L	0.10	1	12/23/10 11:35	12/24/10 00:56	64742-65-0	
n-Octacosane (S) SG	89 %		50-150	1	12/23/10 11:35	12/24/10 00:56	630-02-4	
o-Terphenyl (S) SG	80 %		50-150	1	12/23/10 11:35	12/24/10 00:56	84-15-1	
n-Octacosane (S)	85 %		50-150	1	12/28/10 10:10	12/28/10 21:51	630-02-4	
o-Terphenyl (S)	79 %		50-150	1	12/28/10 10:10	12/28/10 21:51	84-15-1	

<b>Sample: 5-W-17-1210</b>		<b>Lab ID: 256063027</b>	Collected: 12/16/10 08:40	Received: 12/16/10 14:20	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS SG</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.019	1	12/28/10 10:10	12/28/10 22:08		
Diesel Range SG	ND	mg/L	0.019	1	12/23/10 11:35	12/24/10 01:13		
Motor Oil Range	ND	mg/L	0.095	1	12/28/10 10:10	12/28/10 22:08	64742-65-0	
Motor Oil Range SG	ND	mg/L	0.095	1	12/23/10 11:35	12/24/10 01:13	64742-65-0	
n-Octacosane (S) SG	91 %		50-150	1	12/23/10 11:35	12/24/10 01:13	630-02-4	
o-Terphenyl (S) SG	79 %		50-150	1	12/23/10 11:35	12/24/10 01:13	84-15-1	
n-Octacosane (S)	90 %		50-150	1	12/28/10 10:10	12/28/10 22:08	630-02-4	
o-Terphenyl (S)	81 %		50-150	1	12/28/10 10:10	12/28/10 22:08	84-15-1	

<b>Sample: 5-W-15-1210</b>		<b>Lab ID: 256063028</b>	Collected: 12/16/10 10:35	Received: 12/16/10 14:20	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS SG</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.49	mg/L	0.020	1	12/28/10 10:10	12/28/10 22:25		
Diesel Range SG	0.065	mg/L	0.020	1	12/23/10 11:35	12/24/10 02:02		
Motor Oil Range	0.34	mg/L	0.10	1	12/28/10 10:10	12/28/10 22:25	64742-65-0	
Motor Oil Range SG	ND	mg/L	0.098	1	12/23/10 11:35	12/24/10 02:02	64742-65-0	
n-Octacosane (S) SG	67 %		50-150	1	12/23/10 11:35	12/24/10 02:02	630-02-4	
o-Terphenyl (S) SG	61 %		50-150	1	12/23/10 11:35	12/24/10 02:02	84-15-1	
n-Octacosane (S)	87 %		50-150	1	12/28/10 10:10	12/28/10 22:25	630-02-4	
o-Terphenyl (S)	80 %		50-150	1	12/28/10 10:10	12/28/10 22:25	84-15-1	

<b>Sample: 5-W-150-1210</b>		<b>Lab ID: 256063029</b>	Collected: 12/16/10 09:35	Received: 12/16/10 14:20	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS SG</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.47	mg/L	0.020	1	12/28/10 10:10	12/28/10 22:41		

Date: 12/30/2010 11:51 AM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 256063

Sample: 5-W-150-1210		Lab ID: 256063029	Collected: 12/16/10 09:35	Received: 12/16/10 14:20	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS SG</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	<b>0.059</b>	mg/L	0.020	1	12/23/10 11:35	12/24/10 02:19		
Motor Oil Range	<b>0.35</b>	mg/L	0.10	1	12/28/10 10:10	12/28/10 22:41	64742-65-0	
Motor Oil Range SG	ND	mg/L	0.10	1	12/23/10 11:35	12/24/10 02:19	64742-65-0	
n-Octacosane (S) SG	85 %		50-150	1	12/23/10 11:35	12/24/10 02:19	630-02-4	
o-Terphenyl (S) SG	75 %		50-150	1	12/23/10 11:35	12/24/10 02:19	84-15-1	
n-Octacosane (S)	84 %		50-150	1	12/28/10 10:10	12/28/10 22:41	630-02-4	
o-Terphenyl (S)	76 %		50-150	1	12/28/10 10:10	12/28/10 22:41	84-15-1	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 256063

QC Batch: OEXT/3124

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 256063001, 256063002, 256063003, 256063004, 256063005, 256063006, 256063007, 256063008, 256063009, 256063010, 256063011, 256063012, 256063014, 256063015, 256063016, 256063017, 256063018, 256063019, 256063020

METHOD BLANK: 53144

Matrix: Water

Associated Lab Samples: 256063001, 256063002, 256063003, 256063004, 256063005, 256063006, 256063007, 256063008, 256063009, 256063010, 256063011, 256063012, 256063014, 256063015, 256063016, 256063017, 256063018, 256063019, 256063020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	12/23/10 14:09	
Motor Oil Range	mg/L	ND	0.10	12/23/10 14:09	
n-Octacosane (S)	%	97	50-150	12/23/10 14:09	
o-Terphenyl (S)	%	80	50-150	12/23/10 14:09	

LABORATORY CONTROL SAMPLE: 53145

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	0.91	73	51-147	
Motor Oil Range	mg/L	1.2	1.1	84	20-160	
n-Octacosane (S)	%			91	50-150	
o-Terphenyl (S)	%			94	50-150	

SAMPLE DUPLICATE: 53146

Parameter	Units	256063001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.66	0.61	8	
Motor Oil Range	mg/L	0.13	0.13	3	
n-Octacosane (S)	%	101	85	17	
o-Terphenyl (S)	%	91	73	20	

SAMPLE DUPLICATE: 53147

Parameter	Units	256063011 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.057	0.060	4	
Motor Oil Range	mg/L	ND	.07J		
n-Octacosane (S)	%	80	82	3	
o-Terphenyl (S)	%	76	74	3	



## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 256063

QC Batch: OEXT/3125

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 256063014, 256063015, 256063016, 256063024, 256063025, 256063026, 256063027, 256063028, 256063029

METHOD BLANK: 53151

Matrix: Water

Associated Lab Samples: 256063014, 256063015, 256063016, 256063024, 256063025, 256063026, 256063027, 256063028, 256063029

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range SG	mg/L	ND	0.020	12/23/10 22:10	
Motor Oil Range SG	mg/L	ND	0.10	12/23/10 22:10	
n-Octacosane (S) SG	%	93	50-150	12/23/10 22:10	
o-Terphenyl (S) SG	%	79	50-150	12/23/10 22:10	

LABORATORY CONTROL SAMPLE: 53152

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range SG	mg/L	1.2	0.93	75	51-147	
Motor Oil Range SG	mg/L	1.2	1.1	86	20-160	
n-Octacosane (S) SG	%			88	50-150	
o-Terphenyl (S) SG	%			97	50-150	

SAMPLE DUPLICATE: 53153

Parameter	Units	256063014 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/L	ND	.017J		
Motor Oil Range SG	mg/L	ND	ND		
n-Octacosane (S) SG	%	94	92	3	
o-Terphenyl (S) SG	%	87	83	5	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 256063

QC Batch: OEXT/3131

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 256063013, 256063021, 256063022, 256063023, 256063024, 256063025, 256063026, 256063027, 256063028, 256063029

METHOD BLANK: 53440

Matrix: Water

Associated Lab Samples: 256063013, 256063021, 256063022, 256063023, 256063024, 256063025, 256063026, 256063027, 256063028, 256063029

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	12/28/10 17:58	
Motor Oil Range	mg/L	ND	0.10	12/28/10 17:58	
n-Octacosane (S)	%	87	50-150	12/28/10 17:58	
o-Terphenyl (S)	%	76	50-150	12/28/10 17:58	

LABORATORY CONTROL SAMPLE: 53441

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	0.96	76	51-147	
Motor Oil Range	mg/L	1.2	1.1	86	20-160	
n-Octacosane (S)	%			94	50-150	
o-Terphenyl (S)	%			107	50-150	

SAMPLE DUPLICATE: 53442

Parameter	Units	256063021 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.032	0.027	18	
Motor Oil Range	mg/L	ND	.014J		
n-Octacosane (S)	%	90	89	.7	
o-Terphenyl (S)	%	73	77	6	

SAMPLE DUPLICATE: 53477

Parameter	Units	256138001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.091	0.10	9	
Motor Oil Range	mg/L	ND	.041J		
n-Octacosane (S)	%	85	89	5	
o-Terphenyl (S)	%	78	82	5	

## QUALIFIERS

Project: BNSF-Skykomish

Pace Project No.: 256063

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-S Pace Analytical Services - Seattle

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF-Skykomish

Pace Project No.: 256063

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
256063001	1C-W-7-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063002	1C-W-1-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063003	1C-W-8-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063004	2B-W-4-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063005	2A-W-40-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063006	5-W-43-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063007	2A-W-9-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063008	2A-W-10-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063009	MW-4-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063010	MW-3-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063011	MW-30-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063012	GW-1-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063013	2A-W-42-1210	EPA 3510	OEXT/3131	NWTPH-Dx	GCSV/2167
256063017	EW-1-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063018	GW-2-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063019	GW-20-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063020	2A-W-41-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063021	GW-3-1210	EPA 3510	OEXT/3131	NWTPH-Dx	GCSV/2167
256063022	1B-W-23-1210	EPA 3510	OEXT/3131	NWTPH-Dx	GCSV/2167
256063023	GW-4-1210	EPA 3510	OEXT/3131	NWTPH-Dx	GCSV/2167
256063014	5-W-20-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063014	5-W-20-1210	EPA 3510	OEXT/3125	NWTPH-Dx	GCSV/2163
256063015	5-W-42-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063015	5-W-42-1210	EPA 3510	OEXT/3125	NWTPH-Dx	GCSV/2163
256063016	5-W-18-1210	EPA 3510	OEXT/3124	NWTPH-Dx	GCSV/2162
256063016	5-W-18-1210	EPA 3510	OEXT/3125	NWTPH-Dx	GCSV/2163
256063024	5-W-19-1210	EPA 3510	OEXT/3125	NWTPH-Dx	GCSV/2163
256063024	5-W-19-1210	EPA 3510	OEXT/3131	NWTPH-Dx	GCSV/2167
256063025	5-W-16-1210	EPA 3510	OEXT/3125	NWTPH-Dx	GCSV/2163
256063025	5-W-16-1210	EPA 3510	OEXT/3131	NWTPH-Dx	GCSV/2167
256063026	5-W-14-1210	EPA 3510	OEXT/3125	NWTPH-Dx	GCSV/2163
256063026	5-W-14-1210	EPA 3510	OEXT/3131	NWTPH-Dx	GCSV/2167
256063027	5-W-17-1210	EPA 3510	OEXT/3125	NWTPH-Dx	GCSV/2163
256063027	5-W-17-1210	EPA 3510	OEXT/3131	NWTPH-Dx	GCSV/2167
256063028	5-W-15-1210	EPA 3510	OEXT/3125	NWTPH-Dx	GCSV/2163
256063028	5-W-15-1210	EPA 3510	OEXT/3131	NWTPH-Dx	GCSV/2167
256063029	5-W-150-1210	EPA 3510	OEXT/3125	NWTPH-Dx	GCSV/2163
256063029	5-W-150-1210	EPA 3510	OEXT/3131	NWTPH-Dx	GCSV/2167



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

256063

Page: 1 of 3

1438205

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: <u>AECOM</u>		Report To: <u>Sarah Albano</u>		Attention: <u>Bruce Sheppard</u>	
Address: <u>710 2nd Ave Ste 1000</u> <u>Seattle, WA 98104</u>		Copy To: <u>Renee Knecht</u>		Company Name: <u>BNSF</u>	
Email To:		Purchase Order No.: <u>TT0100-J39</u>		Address:	
Phone:		Project Name: <u>BNSF-Skykomish</u>		Pace Quote Reference:	
Fax:		Project Number: <u>60154595-0540</u>		Pace Project Manager:	
Requested Due Date/TAT: <u>std</u>				Pace Profile #:	

<b>REGULATORY AGENCY</b>	
<input type="checkbox"/> NPDES	<input checked="" type="checkbox"/> GROUND WATER
<input type="checkbox"/> UST	<input type="checkbox"/> RCRA
<input type="checkbox"/> OTHER	
Site Location	STATE: <u>WA</u>

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE  Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Tissue TS Other OT	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test ↓ N N/TPH-DX W/10 36CU	Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	<u>Steve K</u>	12/16/10	1420	<u>Jyothi Sway</u>	12/16/10	1420	3.4 2.2 3.2 3.2 5.9 3.2 3.5 4.4
							Y N Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Dean Kinney

SIGNATURE of SAMPLER: Dean Kinney

DATE Signed (MM/DD/YY): 12/16/10



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

256063

## Section A

Required Client Information:

Company: AECOM  
Address: 710 2nd AVE Ste 1000  
Seattle, WA 98104  
Email To:  
Phone:  
Fax:  
Requested Due Date/TAT: Std

## Section B

Required Project Information:

Report To: Sarah Albano  
Copy To: Renee Knecht  
Purchase Order No.: TT0100-J39  
Project Name: BNSF-Skykomish  
Project Number: 60154595-0540

## Section C

Invoice Information:

Attention: Bruce Sheppard  
Company Name: BNSF  
Address:  
Pace Quote Reference:  
Pace Project Manager:  
Pace Profile #:

Page:

2 of 3

**1438201**

## REGULATORY AGENCY

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER  
☐ UST ☐ RCRA ☐ OTHER

Site Location

STATE: WA

## Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Y/N	Analysis Test	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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1	2A-W-42 - 1210	Drinking Water DW					12/15/10	1400	8	2				X																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	SAMPLE CONDITIONS			
	<u>See 2B</u>	12/16/10	1420	<u>S. phw Swamy</u>	12/16/10	1420	3.4°C	Y	N	Y	
							3.2				
							3.3				
							3.2				
							5.9				
							3.2				
							3.5, 4.4°C				

ORIGINAL

## SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Dean Kinney

SIGNATURE of SAMPLER: Dean 2

DATE Signed (MM/DD/YY):

12/16/10



<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company:	Address:	Report To:	Copy To:	Attention:	Company Name:
ACCAN	710 200 AVE, Ste 100B	Sarah Albano	Renee Knecht	Bruce Sheppard	BNSF
Email To:	Seattle WA 98114	Purchase Order No.:	Address:	Pace Quote Reference:	
		PT0100-539			
Phone:	Fac:	Project Name:	Project Number:	Pace Project Manager:	Pace Profile #:
		BNSF-Skykomish	60154595-0540		
Requested Due Date/AT:	SAT			Site Location STATE:	WA
<b>REGULATORY AGENCY</b> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER <input type="checkbox"/>					

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives		Analysis Test	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No. / Lab I.D.
			COMPOSITE START	COMPOSITE END/GRAB			H2SO4	HNO3				
1	SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE	DW WT WW P SL OL WP AR TS OT										
2	5-W-16-1210											
3	1-1-14											
4	1-1-15											
5	1-1-15D											
6												
7												
8												
9												
10												
11												
12												
ADDITIONAL COMMENTS												
Extra sample provided Sat 2/23 at 5-16-1210 for lab AC												

<b>ORIGINAL</b>	
SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER:	DATE Signed
SIGNATURE of SAMPLER:	(MM/DD/YY)
Dean Kinnear	12/16/10

## Sample Container Count

256063

CLIENT:

Aecom



COC PAGE

1 of 3

COC ID#

1438205

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WG9U	WG9U					Comments
1		2														
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic		JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic		R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac		U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic		VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic		VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic		VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic		VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial		VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber vial		WG9U	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial		WGFX	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial		ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial			
BP2O	500mL NaOH plastic		I	Wipe/Swab			

## Sample Container Count

256063

CLIENT: AecomCOC PAGE 2 of 3  
COC ID# 1438201

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU					Comments
1		2 <sup>42</sup>														
2		4 <sup>42</sup>														
3		4 <sup>42</sup>														
4		4 <sup>42</sup>														
5		2 <sup>42</sup>														
6																
7																
8																
9																
10																
11																
12		4 <sup>42</sup>														Trip Blank? <u>ND</u>

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic		JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic		R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac		U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic		VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic		VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic		VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic		VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial		VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber vial		WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial		WGFU	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial		ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial			
BP2O	500mL NaOH plastic		I	Wipe/Swab			

# Sample Container Count

256063

CLIENT: Aecom



COC PAGE 3 of 3  
COC ID# 1390944

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU					Comments
1		100														
2		4														
3		4														
4		4														
5		4														
6																
7																
8																
9																
10																
11																
12																Trip Blank? <u>No</u>

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFY	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic			Wipe/Swab		



**Sample Condition Upon Receipt**Client Name: AecomProject # 256063Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace Other \_\_\_\_\_

Tracking #: \_\_\_\_\_

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No Seals intact: ☐ Yes ☐ NoPacking Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other \_\_\_\_\_ Temp. Blank ☒ Yes ☐ NoThermometer Used 132013 or 101731962 or 226099 Type of Ice: ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begunCooler Temperature 3.4, 2.2, 3.3, 3.2, 5.9 Biological Tissue is Frozen: Yes NoTemp should be above freezing  $\leq 6^{\circ}\text{C}$  3.2, 3.5, 3.5, 4.4

Comments:

Date and Initials of person examining contents: NJB 12/16/10

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>Water</u>		
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G		
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blanks Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: [Signature]Date: 12/17/10

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

January 27, 2011

Mark Havighorst  
AECOM - BNSF  
333 SW 5th Avenue, Suite 225  
Portland, OR 97204

RE: Project: BNSF-Skykomish  
Pace Project No.: 256372

Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on January 26, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Samples requiring thermal preservation were received outside of recommended temperature limits of 0-6 degrees Celsius.

Please note that on the "Quality Control Data" page, Maximum RPD Limits are missing for the sample duplicate for Dx analysis. This is due to a technical malfunction that is in the process of being corrected. All RPD values for all analytes are well within QC limits.

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

Sincerely,



Andy Brownfield

andy.brownfield@pacelabs.com  
Project Manager

Enclosures

## REPORT OF LABORATORY ANALYSIS

Page 1 of 8

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January 27, 2011

Page 2

cc: Sarah Albano, AECOM (BNSF)  
Paul Bianco, AECOM (BNSF)  
Renee Knecht, AECOM (BNSF)  
Jennifer Wald, AECOM (BNSF)

## REPORT OF LABORATORY ANALYSIS

Page 2 of 8

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## CERTIFICATIONS

Project: BNSF-Skykomish

Pace Project No.: 256372

### Washington Certification IDs

940 South Harney Street, Seattle, WA 98108

Alaska CS Certification #: UST-025

Alaska Drinking Water VOC Certification #: WA01230

Alaska Drinking Water Micro Certification #: WA01230

California Certification #: 01153CA

Florida/NELAP Certification #: E87617

Oregon Certification #: WA200007

Washington Certification #: C1229

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## REPORT OF LABORATORY ANALYSIS

Page 3 of 8

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## SAMPLE ANALYTE COUNT

Project: BNSF-Skykomish

Pace Project No.: 256372

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
256372001	IC-W-7-0111	NWTPH-Dx	AY1	4	PASI-S
256372002	IC-W-70-0111	NWTPH-Dx	AY1	4	PASI-S
256372003	IC-W-1-0111	NWTPH-Dx	AY1	4	PASI-S
256372004	IC-W-8-0111	NWTPH-Dx	AY1	4	PASI-S

## REPORT OF LABORATORY ANALYSIS

Page 4 of 8

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 256372

Sample: IC-W-7-0111		Lab ID: 256372001		Collected: 01/26/11 09:05		Received: 01/26/11 14:15		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.082	mg/L	0.019	1	01/26/11 14:45	01/26/11 19:44		
Motor Oil Range		ND	mg/L	0.095	1	01/26/11 14:45	01/26/11 19:44	64742-65-0	
n-Octacosane (S)		90	%	50-150	1	01/26/11 14:45	01/26/11 19:44	630-02-4	
o-Terphenyl (S)		83	%	50-150	1	01/26/11 14:45	01/26/11 19:44	84-15-1	

Sample: IC-W-70-0111		Lab ID: 256372002		Collected: 01/26/11 09:20		Received: 01/26/11 14:15		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.067	mg/L	0.019	1	01/26/11 14:45	01/26/11 20:00		
Motor Oil Range		ND	mg/L	0.095	1	01/26/11 14:45	01/26/11 20:00	64742-65-0	
n-Octacosane (S)		72	%	50-150	1	01/26/11 14:45	01/26/11 20:00	630-02-4	
o-Terphenyl (S)		66	%	50-150	1	01/26/11 14:45	01/26/11 20:00	84-15-1	

Sample: IC-W-1-0111		Lab ID: 256372003		Collected: 01/26/11 10:00		Received: 01/26/11 14:15		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.043	mg/L	0.019	1	01/26/11 14:45	01/26/11 20:17		
Motor Oil Range		ND	mg/L	0.095	1	01/26/11 14:45	01/26/11 20:17	64742-65-0	
n-Octacosane (S)		84	%	50-150	1	01/26/11 14:45	01/26/11 20:17	630-02-4	
o-Terphenyl (S)		77	%	50-150	1	01/26/11 14:45	01/26/11 20:17	84-15-1	

Sample: IC-W-8-0111		Lab ID: 256372004		Collected: 01/26/11 10:50		Received: 01/26/11 14:15		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.31 mg/L		0.019	1	01/26/11 14:45	01/26/11 20:33		
Motor Oil Range		0.12 mg/L		0.095	1	01/26/11 14:45	01/26/11 20:33	64742-65-0	
n-Octacosane (S)		84 %		50-150	1	01/26/11 14:45	01/26/11 20:33	630-02-4	
o-Terphenyl (S)		76 %		50-150	1	01/26/11 14:45	01/26/11 20:33	84-15-1	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 256372

QC Batch: OEXT/3218

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 256372001, 256372002, 256372003, 256372004

METHOD BLANK: 55678

Matrix: Water

Associated Lab Samples: 256372001, 256372002, 256372003, 256372004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	01/26/11 17:32	
Motor Oil Range	mg/L	ND	0.10	01/26/11 17:32	
n-Octacosane (S)	%	89	50-150	01/26/11 17:32	
o-Terphenyl (S)	%	80	50-150	01/26/11 17:32	

LABORATORY CONTROL SAMPLE: 55679

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	0.94	75	51-147	
Motor Oil Range	mg/L	1.2	1.0	84	20-160	
n-Octacosane (S)	%			87	50-150	
o-Terphenyl (S)	%			100	50-150	

SAMPLE DUPLICATE: 55695

Parameter	Units	256370001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.54	0.58	7	
Motor Oil Range	mg/L	0.22	0.25	13	
n-Octacosane (S)	%	76	81	7	
o-Terphenyl (S)	%	71	77	9	

## QUALIFIERS

Project: BNSF-Skykomish

Pace Project No.: 256372

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-S Pace Analytical Services - Seattle

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF-Skykomish

Pace Project No.: 256372

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
256372001	IC-W-7-0111	EPA 3510	OEXT/3218	NWTPH-Dx	GCSV/2220
256372002	IC-W-70-0111	EPA 3510	OEXT/3218	NWTPH-Dx	GCSV/2220
256372003	IC-W-1-0111	EPA 3510	OEXT/3218	NWTPH-Dx	GCSV/2220
256372004	IC-W-8-0111	EPA 3510	OEXT/3218	NWTPH-Dx	GCSV/2220

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

256372

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: <u>BNSF</u>		Report To: <u>Sarah Albano (AECOM)</u>		Attention: <u>Bruce Sheppard</u>	
Address:		Copy To: <u>Renee Knecht</u>		Company Name: <u>BNSF</u>	
Email To:		Purchase Order No.: <u>T10102 - T39</u>		Address:	
Phone:	Fax:	Project Name: <u>BNSF - Skykomish</u>		Pace Quote Reference:	
Requested Due Date/TAT: <u>Std</u>		Project Number: <u>60154595</u>		Pace Project Manager:	
				Pace Profile #:	

Page: 1 of 1

**1309840**

**REGULATORY AGENCY**

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER

Site Location: WA

STATE: WA

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	Matrix Codes Drinking Water DW Water WT Waste Water WW Product P Soil/Solid SL Oil OL Wipe WP Air AR Tissue TS Other OT	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test ↓ NMPH-Dx w/o silica gel	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
						COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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1	IC-W-2-0111			WT				1/26/11	0905	6	2					X																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	<u>Dr L B / AECOM</u>	<u>1/26/11</u>	<u>1415</u>	<u>Iyothi Swamy</u>	<u>1/26/11</u>	<u>1415</u>	<u>7.0</u>	<u>4</u>	<u>N</u>	<u>4</u>

ORIGINAL

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:					
SIGNATURE of SAMPLER:	DATE Signed (MM/DD/YY):				



# Sample Container Count

CLIENT:

BNSF

COC PAGE

of

1309840

COC ID#



256372

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU					Comments
1		2 L														
2		2 L														
3		2 L														
4		2 L														
5																
6																
7																
8																
9																
10																
11																
12																Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber voa vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFU	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		



# Sample Condition Upon Receipt

256372

Client Name: BNSF Project # \_\_\_\_\_

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace Other \_\_\_\_\_

Tracking #: \_\_\_\_\_

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No Seals intact: ☐ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other \_\_\_\_\_ Temp. Blank ☒ Yes ☐ No

Thermometer Used 132013 or 101731962 or 226099 Type of Ice: Wet Blue None ☒ Samples on ice, cooling process has begun

Cooler Temperature 7.0°C

Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: NJS 1/26/11

Temp should be above freezing  $\leq 6^{\circ}\text{C}$

Comments:

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<u>NJS</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix:	<u>Water</u>	
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G		Initial when completed
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Lot # of added preservative
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Trip Blanks Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	15.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: CRB

Date: 1/26/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

February 28, 2011

Mark Havighorst  
AECOM - BNSF  
333 SW 5th Avenue, Suite 225  
Portland, OR 97204

RE: Project: BNSF-Skykomish  
Pace Project No.: 256702

Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on February 22, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,



Andy Brownfield

andy.brownfield@pacelabs.com  
Project Manager

Enclosures

cc: Sarah Albano, AECOM (BNSF)  
Paul Bianco, AECOM (BNSF)  
Renee Knecht, AECOM (BNSF)  
Jennifer Wald, AECOM (BNSF)

## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: BNSF-Skykomish

Pace Project No.: 256702

### Washington Certification IDs

940 South Harney Street, Seattle, WA 98108

Alaska CS Certification #: UST-025

Alaska Drinking Water VOC Certification #: WA01230

Alaska Drinking Water Micro Certification #: WA01230

California Certification #: 01153CA

Florida/NELAP Certification #: E87617

Oregon Certification #: WA200007

Washington Certification #: C1229

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE ANALYTE COUNT

Project: BNSF-Skykomish

Pace Project No.: 256702

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
256702001	IC-W-1-0211	NWTPH-Dx	AY1	4	PASI-S
256702002	IC-W-7-0211	NWTPH-Dx	AY1	4	PASI-S
256702003	IC-W-8-0211	NWTPH-Dx	AY1	4	PASI-S
256702004	IC-W-100-0211	NWTPH-Dx	AY1	4	PASI-S

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 256702

Sample: IC-W-1-0211		Lab ID: 256702001		Collected: 02/21/11 11:40		Received: 02/22/11 08:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range	0.069	mg/L	0.020	1	02/24/11 11:30	02/25/11 13:41			
Motor Oil Range	ND	mg/L	0.098	1	02/24/11 11:30	02/25/11 13:41	64742-65-0		
n-Octacosane (S)	103	%	50-150	1	02/24/11 11:30	02/25/11 13:41	630-02-4		
o-Terphenyl (S)	96	%	50-150	1	02/24/11 11:30	02/25/11 13:41	84-15-1		

Sample: IC-W-7-0211		Lab ID: 256702002		Collected: 02/21/11 09:50		Received: 02/22/11 08:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range	0.089	mg/L	0.020	1	02/24/11 11:30	02/25/11 14:14			
Motor Oil Range	ND	mg/L	0.098	1	02/24/11 11:30	02/25/11 14:14	64742-65-0		
n-Octacosane (S)	90	%	50-150	1	02/24/11 11:30	02/25/11 14:14	630-02-4		
o-Terphenyl (S)	86	%	50-150	1	02/24/11 11:30	02/25/11 14:14	84-15-1		

Sample: IC-W-8-0211		Lab ID: 256702003		Collected: 02/21/11 10:50		Received: 02/22/11 08:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range	0.32	mg/L	0.019	1	02/24/11 11:30	02/25/11 14:31			
Motor Oil Range	0.15	mg/L	0.094	1	02/24/11 11:30	02/25/11 14:31	64742-65-0		
n-Octacosane (S)	97	%	50-150	1	02/24/11 11:30	02/25/11 14:31	630-02-4		
o-Terphenyl (S)	95	%	50-150	1	02/24/11 11:30	02/25/11 14:31	84-15-1		

Sample: IC-W-100-0211		Lab ID: 256702004		Collected: 02/21/11 10:40		Received: 02/22/11 08:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range	0.076	mg/L	0.019	1	02/24/11 11:30	02/25/11 14:48			
Motor Oil Range	ND	mg/L	0.096	1	02/24/11 11:30	02/25/11 14:48	64742-65-0		
n-Octacosane (S)	100	%	50-150	1	02/24/11 11:30	02/25/11 14:48	630-02-4		
o-Terphenyl (S)	96	%	50-150	1	02/24/11 11:30	02/25/11 14:48	84-15-1		

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 256702

QC Batch: OEXT/3352

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 256702001, 256702002, 256702003, 256702004

METHOD BLANK: 59852

Matrix: Water

Associated Lab Samples: 256702001, 256702002, 256702003, 256702004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	02/25/11 12:51	
Motor Oil Range	mg/L	ND	0.10	02/25/11 12:51	
n-Octacosane (S)	%	97	50-150	02/25/11 12:51	
o-Terphenyl (S)	%	77	50-150	02/25/11 12:51	

LABORATORY CONTROL SAMPLE: 59853

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	0.92	74	51-147	
Motor Oil Range	mg/L	1.2	1.1	89	20-160	
n-Octacosane (S)	%			93	50-150	
o-Terphenyl (S)	%			108	50-150	

SAMPLE DUPLICATE: 59854

Parameter	Units	256702001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.069	0.071	3	
Motor Oil Range	mg/L	ND	.081J		
n-Octacosane (S)	%	103	86	18	
o-Terphenyl (S)	%	96	79	20	

## QUALIFIERS

Project: BNSF-Skykomish

Pace Project No.: 256702

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-S Pace Analytical Services - Seattle

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF-Skykomish

Pace Project No.: 256702

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
256702001	IC-W-1-0211	EPA 3510	OEXT/3352	NWTPH-Dx	GCSV/2282
256702002	IC-W-7-0211	EPA 3510	OEXT/3352	NWTPH-Dx	GCSV/2282
256702003	IC-W-8-0211	EPA 3510	OEXT/3352	NWTPH-Dx	GCSV/2282
256702004	IC-W-100-0211	EPA 3510	OEXT/3352	NWTPH-Dx	GCSV/2282







# Sample Container Count

CLIENT: Arcom



COC PAGE 1 of 1  
COC ID# 1438378

256702

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU	Comments
1		2 <sup>12</sup>										11:40
2		2 <sup>12</sup>										0950
3		2 <sup>12</sup>										1050
4		2 <sup>12</sup>										1040
5												
6												
7												
8												
9												
10												
11												
12												Trip Blank? <u>No</u>

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFY	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		



# Sample Condition Upon Receipt

Client Name: AECOMProject # 256702Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace Other \_\_\_\_\_

Tracking #: \_\_\_\_\_

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No Seals intact: ☐ Yes ☐ NoPacking Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other \_\_\_\_\_ Temp. Blank Yes ☒ NoThermometer Used 132013 or 101731962 of 296099 Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begunCooler Temperature 4.30C Biological Tissue is Frozen: Yes NoTemp should be above freezing  $\leq 6^{\circ}\text{C}$ 

Comments:

Date and Initials of person examining contents: NJS 2/22/11

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Follow Up / Hold Analysis Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	8.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Correct Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10. Non-PACE
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample Labels match COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. Sampling time taken from bottle labels. NJS 2/22/11
-Includes date/time/ID/Analysis Matrix:	<u>Water</u>	
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G		Initial when completed
		Lot # of added preservative
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blanks Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	17.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required?

Y / N

Person Contacted: Dean Kinney Date/Time: 2/22/11 1103Comments/ Resolution: Project: Skykomish.Project Manager Review: ARBDate: 2/22/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

April 06, 2011

Mark Havighorst  
AECOM - BNSF  
333 SW 5th Avenue, Suite 225  
Portland, OR 97204

RE: Project: BNSF-Skykomish  
Pace Project No.: 257035

Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on March 23, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,



Andy Brownfield

andy.brownfield@pacelabs.com  
Project Manager

Enclosures

cc: Sarah Albano, AECOM (BNSF)  
Paul Bianco, AECOM (BNSF)  
Renee Knecht, AECOM (BNSF)  
Jennifer Wald, AECOM (BNSF)

## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: BNSF-Skykomish

Pace Project No.: 257035

### Washington Certification IDs

940 South Harney Street, Seattle, WA 98108

Alaska CS Certification #: UST-025

Alaska Drinking Water VOC Certification #: WA01230

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California Certification #: 01153CA

Florida/NELAP Certification #: E87617

Oregon Certification #: WA200007

Washington Certification #: C1229

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## SAMPLE ANALYTE COUNT

Project: BNSF-Skykomish

Pace Project No.: 257035

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
257035001	2B-W-4-0311	NWTPH-Dx	AY1	4	PASI-S
257035002	5-W-43-0311	NWTPH-Dx	AY1	4	PASI-S
257035003	GW-1-0311	NWTPH-Dx	AY1	4	PASI-S
257035004	GW-2-0311	NWTPH-Dx	AY1	4	PASI-S
257035005	MW-38R-0311	NWTPH-Dx	AY1	4	PASI-S
257035006	GW-3-0311	NWTPH-Dx	AY1	4	PASI-S
257035007	GW-30-0311	NWTPH-Dx	AY1	4	PASI-S
257035008	5-W-18-0311	NWTPH-Dx	AY1	4	PASI-S
257035009	5-W-19-0311	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
257035010	5-W-20-0311	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
257035011	5-W-42-0311	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
257035012	5-W-14-0311	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
257035013	5-W-15-0311	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
257035014	5-W-16-0311	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
257035015	1C-W-3-0311	NWTPH-Dx	AY1	4	PASI-S
257035016	1C-W-1-0311	NWTPH-Dx	AY1	4	PASI-S
257035017	1C-W-8-0311	NWTPH-Dx	AY1	4	PASI-S
257035018	5-W-17-0311	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
257035019	5-W-170-0311	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
257035020	5-W-50-0311	NWTPH-Dx	AY1	4	PASI-S
257035021	5-W-54-0311	NWTPH-Dx	AY1	4	PASI-S
257035022	EW-1-0311	NWTPH-Dx	AY1	4	PASI-S
257035023	5-W-540-0311	NWTPH-Dx	AY1	4	PASI-S
257035024	1C-W-4-0311	NWTPH-Dx	AY1	4	PASI-S
257035025	1C-W-7-0311	NWTPH-Dx	AY1	4	PASI-S
257035026	1B-W-3-0311	NWTPH-Dx	AY1	4	PASI-S

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish  
Pace Project No.: 257035

<b>Sample: 2B-W-4-0311</b>		<b>Lab ID: 257035001</b>	Collected: 03/21/11 09:30		Received: 03/23/11 08:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.019	1	03/30/11 12:50	03/30/11 23:24		
Motor Oil Range	ND	mg/L	0.095	1	03/30/11 12:50	03/30/11 23:24	64742-65-0	
n-Octacosane (S)	87 %		50-150	1	03/30/11 12:50	03/30/11 23:24	630-02-4	
o-Terphenyl (S)	80 %		50-150	1	03/30/11 12:50	03/30/11 23:24	84-15-1	

<b>Sample: 5-W-43-0311</b>		<b>Lab ID: 257035002</b>	Collected: 03/21/11 14:00		Received: 03/23/11 08:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.020</b>	mg/L	0.019	1	03/30/11 12:50	03/31/11 00:11		
Motor Oil Range	ND	mg/L	0.095	1	03/30/11 12:50	03/31/11 00:11	64742-65-0	
n-Octacosane (S)	92 %		50-150	1	03/30/11 12:50	03/31/11 00:11	630-02-4	
o-Terphenyl (S)	86 %		50-150	1	03/30/11 12:50	03/31/11 00:11	84-15-1	

<b>Sample: GW-1-0311</b>		<b>Lab ID: 257035003</b>	Collected: 03/21/11 14:40		Received: 03/23/11 08:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.028</b>	mg/L	0.019	1	03/30/11 12:50	03/31/11 00:34		
Motor Oil Range	ND	mg/L	0.095	1	03/30/11 12:50	03/31/11 00:34	64742-65-0	
n-Octacosane (S)	86 %		50-150	1	03/30/11 12:50	03/31/11 00:34	630-02-4	
o-Terphenyl (S)	82 %		50-150	1	03/30/11 12:50	03/31/11 00:34	84-15-1	

<b>Sample: GW-2-0311</b>		<b>Lab ID: 257035004</b>	Collected: 03/21/11 15:55		Received: 03/23/11 08:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.036</b>	mg/L	0.019	1	03/30/11 12:50	03/31/11 00:58		
Motor Oil Range	ND	mg/L	0.095	1	03/30/11 12:50	03/31/11 00:58	64742-65-0	
n-Octacosane (S)	91 %		50-150	1	03/30/11 12:50	03/31/11 00:58	630-02-4	
o-Terphenyl (S)	84 %		50-150	1	03/30/11 12:50	03/31/11 00:58	84-15-1	

<b>Sample: MW-38R-0311</b>		<b>Lab ID: 257035005</b>	Collected: 03/21/11 15:15		Received: 03/23/11 08:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.047</b>	mg/L	0.019	1	03/30/11 12:50	03/31/11 01:21		
Motor Oil Range	ND	mg/L	0.095	1	03/30/11 12:50	03/31/11 01:21	64742-65-0	

Date: 04/06/2011 02:33 PM

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 257035

Sample: MW-38R-0311		Lab ID: 257035005	Collected: 03/21/11 15:15	Received: 03/23/11 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

n-Octacosane (S)	92 %		50-150	1	03/30/11 12:50	03/31/11 01:21	630-02-4	
o-Terphenyl (S)	85 %		50-150	1	03/30/11 12:50	03/31/11 01:21	84-15-1	

Sample: GW-3-0311		Lab ID: 257035006	Collected: 03/21/11 16:40	Received: 03/23/11 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	<b>0.030</b> mg/L		0.019	1	03/30/11 12:50	03/31/11 01:44		
Motor Oil Range	ND mg/L		0.095	1	03/30/11 12:50	03/31/11 01:44	64742-65-0	
n-Octacosane (S)	91 %		50-150	1	03/30/11 12:50	03/31/11 01:44	630-02-4	
o-Terphenyl (S)	81 %		50-150	1	03/30/11 12:50	03/31/11 01:44	84-15-1	

Sample: GW-30-0311		Lab ID: 257035007	Collected: 03/21/11 16:55	Received: 03/23/11 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	<b>0.027</b> mg/L		0.019	1	03/30/11 12:50	03/31/11 02:55		
Motor Oil Range	ND mg/L		0.095	1	03/30/11 12:50	03/31/11 02:55	64742-65-0	
n-Octacosane (S)	91 %		50-150	1	03/30/11 12:50	03/31/11 02:55	630-02-4	
o-Terphenyl (S)	81 %		50-150	1	03/30/11 12:50	03/31/11 02:55	84-15-1	

Sample: 5-W-18-0311		Lab ID: 257035008	Collected: 03/22/11 09:10	Received: 03/23/11 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	<b>0.16</b> mg/L		0.019	1	03/25/11 11:35	03/28/11 17:13		
Motor Oil Range	<b>0.11</b> mg/L		0.094	1	03/25/11 11:35	03/28/11 17:13	64742-65-0	
n-Octacosane (S)	92 %		50-150	1	03/25/11 11:35	03/28/11 17:13	630-02-4	
o-Terphenyl (S)	90 %		50-150	1	03/25/11 11:35	03/28/11 17:13	84-15-1	

### NWTPH-Dx GCS Silica Gel

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range SG	<b>0.034</b> mg/L		0.019	1	03/25/11 11:35	03/28/11 13:24		
Motor Oil Range SG	ND mg/L		0.094	1	03/25/11 11:35	03/28/11 13:24	64742-65-0	
n-Octacosane (S) SG	96 %		50-150	1	03/25/11 11:35	03/28/11 13:24	630-02-4	
o-Terphenyl (S) SG	93 %		50-150	1	03/25/11 11:35	03/28/11 13:24	84-15-1	

## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 257035

Sample: 5-W-19-0311		Lab ID: 257035009	Collected: 03/22/11 09:50	Received: 03/23/11 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.019	1	03/25/11 11:35	03/28/11 17:29		
Motor Oil Range	ND	mg/L	0.094	1	03/25/11 11:35	03/28/11 17:29	64742-65-0	
n-Octacosane (S)	92 %		50-150	1	03/25/11 11:35	03/28/11 17:29	630-02-4	
o-Terphenyl (S)	89 %		50-150	1	03/25/11 11:35	03/28/11 17:29	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND	mg/L	0.019	1	03/25/11 11:35	03/28/11 13:41		
Motor Oil Range SG	ND	mg/L	0.094	1	03/25/11 11:35	03/28/11 13:41	64742-65-0	
n-Octacosane (S) SG	102 %		50-150	1	03/25/11 11:35	03/28/11 13:41	630-02-4	
o-Terphenyl (S) SG	98 %		50-150	1	03/25/11 11:35	03/28/11 13:41	84-15-1	

Sample: 5-W-20-0311		Lab ID: 257035010	Collected: 03/22/11 10:55	Received: 03/23/11 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.13	mg/L	0.019	1	03/25/11 11:35	03/28/11 18:33		
Motor Oil Range	ND	mg/L	0.094	1	03/25/11 11:35	03/28/11 18:33	64742-65-0	
n-Octacosane (S)	87 %		50-150	1	03/25/11 11:35	03/28/11 18:33	630-02-4	
o-Terphenyl (S)	82 %		50-150	1	03/25/11 11:35	03/28/11 18:33	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND	mg/L	0.019	1	03/25/11 11:35	03/28/11 14:13		
Motor Oil Range SG	ND	mg/L	0.094	1	03/25/11 11:35	03/28/11 14:13	64742-65-0	
n-Octacosane (S) SG	97 %		50-150	1	03/25/11 11:35	03/28/11 14:13	630-02-4	
o-Terphenyl (S) SG	90 %		50-150	1	03/25/11 11:35	03/28/11 14:13	84-15-1	

Sample: 5-W-42-0311		Lab ID: 257035011	Collected: 03/22/11 11:35	Received: 03/23/11 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.036	mg/L	0.019	1	03/25/11 11:35	03/28/11 18:49		
Motor Oil Range	ND	mg/L	0.094	1	03/25/11 11:35	03/28/11 18:49	64742-65-0	
n-Octacosane (S)	85 %		50-150	1	03/25/11 11:35	03/28/11 18:49	630-02-4	
o-Terphenyl (S)	81 %		50-150	1	03/25/11 11:35	03/28/11 18:49	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND	mg/L	0.019	1	03/25/11 11:35	03/28/11 14:30		
Motor Oil Range SG	ND	mg/L	0.094	1	03/25/11 11:35	03/28/11 14:30	64742-65-0	
n-Octacosane (S) SG	90 %		50-150	1	03/25/11 11:35	03/28/11 14:30	630-02-4	
o-Terphenyl (S) SG	86 %		50-150	1	03/25/11 11:35	03/28/11 14:30	84-15-1	

## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 257035

Sample: 5-W-14-0311		Lab ID: 257035012	Collected: 03/22/11 09:15	Received: 03/23/11 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.019	1	03/25/11 11:35	03/28/11 19:06		
Motor Oil Range	ND	mg/L	0.097	1	03/25/11 11:35	03/28/11 19:06	64742-65-0	
n-Octacosane (S)	80	%	50-150	1	03/25/11 11:35	03/28/11 19:06	630-02-4	
o-Terphenyl (S)	62	%	50-150	1	03/25/11 11:35	03/28/11 19:06	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND	mg/L	0.019	1	03/25/11 11:35	03/28/11 15:19		
Motor Oil Range SG	ND	mg/L	0.097	1	03/25/11 11:35	03/28/11 15:19	64742-65-0	
n-Octacosane (S) SG	86	%	50-150	1	03/25/11 11:35	03/28/11 15:19	630-02-4	
o-Terphenyl (S) SG	66	%	50-150	1	03/25/11 11:35	03/28/11 15:19	84-15-1	

Sample: 5-W-15-0311		Lab ID: 257035013	Collected: 03/22/11 11:20	Received: 03/23/11 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.35	mg/L	0.019	1	03/25/11 11:35	03/28/11 19:22		
Motor Oil Range	0.22	mg/L	0.097	1	03/25/11 11:35	03/28/11 19:22	64742-65-0	
n-Octacosane (S)	81	%	50-150	1	03/25/11 11:35	03/28/11 19:22	630-02-4	
o-Terphenyl (S)	75	%	50-150	1	03/25/11 11:35	03/28/11 19:22	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	0.033	mg/L	0.019	1	03/25/11 11:35	03/28/11 15:35		
Motor Oil Range SG	ND	mg/L	0.097	1	03/25/11 11:35	03/28/11 15:35	64742-65-0	
n-Octacosane (S) SG	89	%	50-150	1	03/25/11 11:35	03/28/11 15:35	630-02-4	
o-Terphenyl (S) SG	81	%	50-150	1	03/25/11 11:35	03/28/11 15:35	84-15-1	

Sample: 5-W-16-0311		Lab ID: 257035014	Collected: 03/22/11 10:15	Received: 03/23/11 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.028	mg/L	0.019	1	03/25/11 11:35	03/28/11 19:38		
Motor Oil Range	ND	mg/L	0.097	1	03/25/11 11:35	03/28/11 19:38	64742-65-0	
n-Octacosane (S)	83	%	50-150	1	03/25/11 11:35	03/28/11 19:38	630-02-4	
o-Terphenyl (S)	71	%	50-150	1	03/25/11 11:35	03/28/11 19:38	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND	mg/L	0.019	1	03/25/11 11:35	03/28/11 15:51		
Motor Oil Range SG	ND	mg/L	0.097	1	03/25/11 11:35	03/28/11 15:51	64742-65-0	
n-Octacosane (S) SG	85	%	50-150	1	03/25/11 11:35	03/28/11 15:51	630-02-4	
o-Terphenyl (S) SG	72	%	50-150	1	03/25/11 11:35	03/28/11 15:51	84-15-1	

## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 257035

Sample: 1C-W-3-0311		Lab ID: 257035015		Collected: 03/22/11 11:25		Received: 03/23/11 08:00		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.019	1	03/30/11 12:50	03/31/11 03:18		
Motor Oil Range		ND mg/L		0.094	1	03/30/11 12:50	03/31/11 03:18	64742-65-0	
n-Octacosane (S)		95 %		50-150	1	03/30/11 12:50	03/31/11 03:18	630-02-4	
o-Terphenyl (S)		86 %		50-150	1	03/30/11 12:50	03/31/11 03:18	84-15-1	

Sample: 1C-W-1-0311		Lab ID: 257035016		Collected: 03/22/11 10:20		Received: 03/23/11 08:00		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.055	mg/L	0.019	1	03/30/11 12:50	03/31/11 03:42		
Motor Oil Range		ND	mg/L	0.097	1	03/30/11 12:50	03/31/11 03:42	64742-65-0	
n-Octacosane (S)		88	%	50-150	1	03/30/11 12:50	03/31/11 03:42	630-02-4	
o-Terphenyl (S)		79	%	50-150	1	03/30/11 12:50	03/31/11 03:42	84-15-1	

Sample: 1C-W-8-0311		Lab ID: 257035017		Collected: 03/22/11 09:40		Received: 03/23/11 08:00		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.25 mg/L		0.019	1	03/30/11 12:50	03/31/11 04:05		
Motor Oil Range		0.12 mg/L		0.095	1	03/30/11 12:50	03/31/11 04:05	64742-65-0	
n-Octacosane (S)		90 %		50-150	1	03/30/11 12:50	03/31/11 04:05	630-02-4	
o-Terphenyl (S)		84 %		50-150	1	03/30/11 12:50	03/31/11 04:05	84-15-1	

Sample: 5-W-17-0311		Lab ID: 257035018		Collected: 03/22/11 13:05		Received: 03/23/11 08:00		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.019	1	03/25/11 11:35	03/28/11 19:54		
Motor Oil Range		ND mg/L		0.097	1	03/25/11 11:35	03/28/11 19:54	64742-65-0	
n-Octacosane (S)		88 %		50-150	1	03/25/11 11:35	03/28/11 19:54	630-02-4	
o-Terphenyl (S)		75 %		50-150	1	03/25/11 11:35	03/28/11 19:54	84-15-1	

NWTPH-Dx GCS Silica Gel		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND mg/L	0.019	1	03/25/11 11:35	03/28/11 16:08			
Motor Oil Range SG	ND mg/L	0.097	1	03/25/11 11:35	03/28/11 16:08	64742-65-0		
n-Octacosane (S) SG	92 %	50-150	1	03/25/11 11:35	03/28/11 16:08	630-02-4		
o-Terphenyl (S) SG	78 %	50-150	1	03/25/11 11:35	03/28/11 16:08	84-15-1		



## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 257035

Sample: 5-W-170-0311		Lab ID: 257035019	Collected: 03/22/11 12:05	Received: 03/23/11 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND mg/L		0.019	1	03/25/11 11:35	03/28/11 20:09		
Motor Oil Range	ND mg/L		0.097	1	03/25/11 11:35	03/28/11 20:09	64742-65-0	
n-Octacosane (S)	84 %		50-150	1	03/25/11 11:35	03/28/11 20:09	630-02-4	
o-Terphenyl (S)	74 %		50-150	1	03/25/11 11:35	03/28/11 20:09	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND mg/L		0.019	1	03/25/11 11:35	03/28/11 16:24		
Motor Oil Range SG	ND mg/L		0.097	1	03/25/11 11:35	03/28/11 16:24	64742-65-0	
n-Octacosane (S) SG	90 %		50-150	1	03/25/11 11:35	03/28/11 16:24	630-02-4	
o-Terphenyl (S) SG	79 %		50-150	1	03/25/11 11:35	03/28/11 16:24	84-15-1	

Sample: 5-W-50-0311		Lab ID: 257035020	Collected: 03/22/11 13:15	Received: 03/23/11 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	1.2 mg/L		0.019	1	03/30/11 12:50	03/31/11 04:28		
Motor Oil Range	0.79 mg/L		0.095	1	03/30/11 12:50	03/31/11 04:28	64742-65-0	
n-Octacosane (S)	80 %		50-150	1	03/30/11 12:50	03/31/11 04:28	630-02-4	
o-Terphenyl (S)	74 %		50-150	1	03/30/11 12:50	03/31/11 04:28	84-15-1	

Sample: 5-W-54-0311		Lab ID: 257035021	Collected: 03/22/11 14:35	Received: 03/23/11 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.023 mg/L		0.020	1	03/30/11 12:50	03/31/11 04:52		
Motor Oil Range	ND mg/L		0.10	1	03/30/11 12:50	03/31/11 04:52	64742-65-0	
n-Octacosane (S)	75 %		50-150	1	03/30/11 12:50	03/31/11 04:52	630-02-4	
o-Terphenyl (S)	63 %		50-150	1	03/30/11 12:50	03/31/11 04:52	84-15-1	

Sample: EW-1-0311		Lab ID: 257035022	Collected: 03/22/11 14:10	Received: 03/23/11 08:00	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.032 mg/L		0.019	1	03/30/11 12:50	03/31/11 18:09		
Motor Oil Range	ND mg/L		0.095	1	03/30/11 12:50	03/31/11 18:09	64742-65-0	
n-Octacosane (S)	53 %		50-150	1	03/30/11 12:50	03/31/11 18:09	630-02-4	
o-Terphenyl (S)	52 %		50-150	1	03/30/11 12:50	03/31/11 18:09	84-15-1	

## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 257035

<b>Sample: 5-W-540-0311</b>		<b>Lab ID: 257035023</b>	Collected: 03/22/11 14:00		Received: 03/23/11 08:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.024</b>	mg/L	0.020	1	03/30/11 15:40	03/31/11 06:02		
Motor Oil Range	ND	mg/L	0.10	1	03/30/11 15:40	03/31/11 06:02	64742-65-0	
n-Octacosane (S)	75 %		50-150	1	03/30/11 15:40	03/31/11 06:02	630-02-4	
o-Terphenyl (S)	71 %		50-150	1	03/30/11 15:40	03/31/11 06:02	84-15-1	

<b>Sample: 1C-W-4-0311</b>		<b>Lab ID: 257035024</b>	Collected: 03/22/11 13:30		Received: 03/23/11 08:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.25</b>	mg/L	0.020	1	03/30/11 15:40	03/31/11 07:58		
Motor Oil Range	<b>0.21</b>	mg/L	0.099	1	03/30/11 15:40	03/31/11 07:58	64742-65-0	
n-Octacosane (S)	88 %		50-150	1	03/30/11 15:40	03/31/11 07:58	630-02-4	
o-Terphenyl (S)	80 %		50-150	1	03/30/11 15:40	03/31/11 07:58	84-15-1	

<b>Sample: 1C-W-7-0311</b>		<b>Lab ID: 257035025</b>	Collected: 03/22/11 14:35		Received: 03/23/11 08:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.051</b>	mg/L	0.019	1	03/30/11 15:40	03/31/11 08:22		
Motor Oil Range	ND	mg/L	0.097	1	03/30/11 15:40	03/31/11 08:22	64742-65-0	
n-Octacosane (S)	80 %		50-150	1	03/30/11 15:40	03/31/11 08:22	630-02-4	
o-Terphenyl (S)	70 %		50-150	1	03/30/11 15:40	03/31/11 08:22	84-15-1	

<b>Sample: 1B-W-3-0311</b>		<b>Lab ID: 257035026</b>	Collected: 03/22/11 15:35		Received: 03/23/11 08:00		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.019	1	03/30/11 15:40	03/31/11 08:45		
Motor Oil Range	ND	mg/L	0.097	1	03/30/11 15:40	03/31/11 08:45	64742-65-0	
n-Octacosane (S)	83 %		50-150	1	03/30/11 15:40	03/31/11 08:45	630-02-4	
o-Terphenyl (S)	77 %		50-150	1	03/30/11 15:40	03/31/11 08:45	84-15-1	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 257035

QC Batch: OEXT/3472

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 257035008, 257035009, 257035010, 257035011, 257035012, 257035013, 257035014, 257035018, 257035019

METHOD BLANK: 63978

Matrix: Water

Associated Lab Samples: 257035008, 257035009, 257035010, 257035011, 257035012, 257035013, 257035014, 257035018, 257035019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	03/28/11 16:40	
Motor Oil Range	mg/L	ND	0.10	03/28/11 16:40	
n-Octacosane (S)	%	93	50-150	03/28/11 16:40	
o-Terphenyl (S)	%	82	50-150	03/28/11 16:40	

LABORATORY CONTROL SAMPLE: 63979

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	0.93	74	51-147	
Motor Oil Range	mg/L	1.2	1.0	84	20-160	
n-Octacosane (S)	%			94	50-150	
o-Terphenyl (S)	%			103	50-150	

SAMPLE DUPLICATE: 63980

Parameter	Units	257035009 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND	.013J		
Motor Oil Range	mg/L	ND	.01J		
n-Octacosane (S)	%	92	87	6	
o-Terphenyl (S)	%	89	84	6	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 257035

QC Batch:	OEXT/3492	Analysis Method:	NWTPH-Dx
QC Batch Method:	EPA 3510	Analysis Description:	NWTPH-Dx GCS
Associated Lab Samples:	257035001, 257035002, 257035003, 257035004, 257035005, 257035006, 257035007, 257035015, 257035016, 257035017, 257035020, 257035021, 257035022, 257035023, 257035024, 257035025, 257035026		

METHOD BLANK: 64616 Matrix: Water

Associated Lab Samples: 257035001, 257035002, 257035003, 257035004, 257035005, 257035006, 257035007, 257035015, 257035016, 257035017, 257035020, 257035021, 257035022, 257035023, 257035024, 257035025, 257035026

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	03/30/11 22:37	
Motor Oil Range	mg/L	ND	0.10	03/30/11 22:37	
n-Octacosane (S)	%	89	50-150	03/30/11 22:37	
o-Terphenyl (S)	%	80	50-150	03/30/11 22:37	

LABORATORY CONTROL SAMPLE: 64617

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	0.84	67	51-147	
Motor Oil Range	mg/L	1.2	0.96	77	20-160	
n-Octacosane (S)	%			87	50-150	
o-Terphenyl (S)	%			112	50-150	

SAMPLE DUPLICATE: 64618

Parameter	Units	257035001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND	.0062J		
Motor Oil Range	mg/L	ND	.036J		
n-Octacosane (S)	%	87	90	4	
o-Terphenyl (S)	%	80	84	4	

SAMPLE DUPLICATE: 64619

Parameter	Units	257035022 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.032	0.026	20	
Motor Oil Range	mg/L	ND	.064J		
n-Octacosane (S)	%	53	97	59	
o-Terphenyl (S)	%	52	90	54	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 257035

QC Batch: OEXT/3471

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS SG

Associated Lab Samples: 257035008, 257035009, 257035010, 257035011, 257035012, 257035013, 257035014, 257035018, 257035019

METHOD BLANK: 63975

Matrix: Water

Associated Lab Samples: 257035008, 257035009, 257035010, 257035011, 257035012, 257035013, 257035014, 257035018, 257035019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range SG	mg/L	ND	0.020	03/28/11 12:52	
Motor Oil Range SG	mg/L	ND	0.10	03/28/11 12:52	
n-Octacosane (S) SG	%	98	50-150	03/28/11 12:52	
o-Terphenyl (S) SG	%	86	50-150	03/28/11 12:52	

LABORATORY CONTROL SAMPLE: 63976

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range SG	mg/L	1.2	0.93	74	51-147	
Motor Oil Range SG	mg/L	1.2	1.1	87	20-160	
n-Octacosane (S) SG	%			100	50-150	
o-Terphenyl (S) SG	%			107	50-150	

SAMPLE DUPLICATE: 63977

Parameter	Units	257035009 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/L	ND	.013J		
Motor Oil Range SG	mg/L	ND	ND		
n-Octacosane (S) SG	%	102	94	9	
o-Terphenyl (S) SG	%	98	89	9	



## QUALIFIERS

Project: BNSF-Skykomish

Pace Project No.: 257035

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-S Pace Analytical Services - Seattle

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF-Skykomish

Pace Project No.: 257035

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
257035001	2B-W-4-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035002	5-W-43-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035003	GW-1-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035004	GW-2-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035005	MW-38R-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035006	GW-3-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035007	GW-30-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035008	5-W-18-0311	EPA 3510	OEXT/3472	NWTPH-Dx	GCSV/2357
257035009	5-W-19-0311	EPA 3510	OEXT/3472	NWTPH-Dx	GCSV/2357
257035010	5-W-20-0311	EPA 3510	OEXT/3472	NWTPH-Dx	GCSV/2357
257035011	5-W-42-0311	EPA 3510	OEXT/3472	NWTPH-Dx	GCSV/2357
257035012	5-W-14-0311	EPA 3510	OEXT/3472	NWTPH-Dx	GCSV/2357
257035013	5-W-15-0311	EPA 3510	OEXT/3472	NWTPH-Dx	GCSV/2357
257035014	5-W-16-0311	EPA 3510	OEXT/3472	NWTPH-Dx	GCSV/2357
257035015	1C-W-3-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035016	1C-W-1-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035017	1C-W-8-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035018	5-W-17-0311	EPA 3510	OEXT/3472	NWTPH-Dx	GCSV/2357
257035019	5-W-170-0311	EPA 3510	OEXT/3472	NWTPH-Dx	GCSV/2357
257035020	5-W-50-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035021	5-W-54-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035022	EW-1-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035023	5-W-540-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035024	1C-W-4-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035025	1C-W-7-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035026	1B-W-3-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257035008	5-W-18-0311	EPA 3510	OEXT/3471	NWTPH-Dx	GCSV/2359
257035009	5-W-19-0311	EPA 3510	OEXT/3471	NWTPH-Dx	GCSV/2359
257035010	5-W-20-0311	EPA 3510	OEXT/3471	NWTPH-Dx	GCSV/2359
257035011	5-W-42-0311	EPA 3510	OEXT/3471	NWTPH-Dx	GCSV/2359
257035012	5-W-14-0311	EPA 3510	OEXT/3471	NWTPH-Dx	GCSV/2359
257035013	5-W-15-0311	EPA 3510	OEXT/3471	NWTPH-Dx	GCSV/2359
257035014	5-W-16-0311	EPA 3510	OEXT/3471	NWTPH-Dx	GCSV/2359
257035018	5-W-17-0311	EPA 3510	OEXT/3471	NWTPH-Dx	GCSV/2359
257035019	5-W-170-0311	EPA 3510	OEXT/3471	NWTPH-Dx	GCSV/2359

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

257035

## Section A Required Client Information:

Company: BNSF  
Address: \_\_\_\_\_  
Email To: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
Requested Due Date/TAT: std

## Section B Required Project Information:

Report To: Sarah Albano  
Copy To: Ranee Knecht  
Purchase Order No.: TT0100-J39  
Project Name: BNSF-Skykomish  
Project Number: 60191113

## Section C Invoice Information:

Attention: Bruce Sheppard  
Company Name: BNSF  
Address: \_\_\_\_\_  
Pace Quote Reference: \_\_\_\_\_  
Pace Project Manager: \_\_\_\_\_  
Pace Profile #: \_\_\_\_\_

Page: 1 of 3  
**1468035**

**REGULATORY AGENCY**  
☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER  
☐ UST ☐ RCRA ☐ OTHER \_\_\_\_\_  
Site Location: \_\_\_\_\_  
STATE: WA

## Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information		Matrix Codes MATRIX / CODE		MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test Y/N	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
							COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other			
DATE	TIME	DATE	TIME																				

1	ZB-W-4	-0311					3/21/11	0930	4	2				X																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
W/SGC - without silica gel cleanup	Mindy Gaddor AECOM	3/23/11	0800	Bette Wehrer PACE	032311	0800	4.7	Y	N	Y
W/SGC - with silica gel cleanup							5.4			
							5.5			
5-W-19-0311: extra sample volume for MS/MSDS ORIGINAL							5.2	3.8	4.3	4.7, 4.2

SAMPLER NAME AND SIGNATURE: Mindy Gaddor  
PRINT Name of SAMPLER: Mindy Gaddor  
SIGNATURE of SAMPLER: Mindy Gaddor  
DATE Signed (MM/DD/YY): 03/23/11

Temp in °C: \_\_\_\_\_  
Received on Ice (Y/N): \_\_\_\_\_  
Custody Sealed Cooler (Y/N): \_\_\_\_\_  
Samples Intact (Y/N): \_\_\_\_\_



## Section A

**Required Client Information:**

## Section B

**Required Project Information:**

### Section C

Invoice Information:

Company: <b>BNSF</b>		Report To: <b>Sarah Albano</b>	Attention: <b>Bruce Sheppard</b>	1468037	
Address:		Copy To: <b>Renee Knecht</b>	Company Name: <b>BNSF</b>	REGULATORY AGENCY	
			Address:	<input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER _____	
Email To:		Purchase Order No.: <b>TT0100-J39</b>	Pace Quote Reference:	Site Location	
Phone:	Fax:	Project Name: <b>BNSF-Skykomish</b>	Pace Project Manager:	STATE: <b>WA</b>	
Requested Due Date/TAT: <b>Std</b>		Project Number: <b>60191113</b>	Pace Profile #:		

[illegible]



257035

1468036

ORIGINAL



# Sample Container Count

257035

CLIENT:

AECOM



COC PAGE

1 of 3

COC ID#

1468035

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU					Comments
1		2														
2																
3																
4																
5																
6																
7																
8		4														
9		10														
10		4														
11																
12																Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber voa vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFY	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		

# Sample Container Count

257035

CLIENT:

AECOM



COC PAGE

2 of 3

COC ID#

1468037

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU					Comments
1		4														
2		4														
3		2														
4		2														
5		2														
6		4														
7		4														
8		2														
9		1														
10		1														
11		1														
12		1														Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber voa vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFY	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		



## Sample Container Count

CLIENT:

AECOM



COC PAGE 3 of 3

COC ID# 1468036

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU					Comments
1		2-2														
2		↓ ↓														
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFY	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		



# Sample Condition Upon Receipt

Client Name: AECOM

Project # 257035

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace Other \_\_\_\_\_

Tracking #: \_\_\_\_\_

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No Seals intact: ☐ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other \_\_\_\_\_ Temp. Blank Yes ☒ No

Thermometer Used 132013 or 101731962 or 226099 Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 4.7, 5.4, 5.5, 5.2, 3.8, 4.3 Biological Tissue is Frozen: Yes No

Temp should be above freezing  $\leq 6^{\circ}\text{C}$  4.7, 4.2

Comments:

Date and Initials of person examining contents: 03/23/11 CW

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Follow Up / Hold Analysis Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	8.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
-Includes date/time/ID/Analysis Matrix: <u>WT</u>		
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G		Initial when completed
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Lot # of added preservative
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blanks Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	17.
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Project Manager Review: ARB

Date: 3/23/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

April 06, 2011

Mark Havighorst  
AECOM - BNSF  
333 SW 5th Avenue, Suite 225  
Portland, OR 97204

RE: Project: BNSF-Skykomish  
Pace Project No.: 257056

Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on March 23, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,



Andy Brownfield

andy.brownfield@pacelabs.com  
Project Manager

Enclosures

cc: Sarah Albano, AECOM (BNSF)  
Paul Bianco, AECOM (BNSF)  
Renee Knecht, AECOM (BNSF)  
Jennifer Wald, AECOM (BNSF)

## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: BNSF-Skykomish

Pace Project No.: 257056

### Washington Certification IDs

940 South Harney Street, Seattle, WA 98108

Alaska CS Certification #: UST-025

Alaska Drinking Water VOC Certification #: WA01230

Alaska Drinking Water Micro Certification #: WA01230

California Certification #: 01153CA

Florida/NELAP Certification #: E87617

Oregon Certification #: WA200007

Washington Certification #: C1229

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## SAMPLE ANALYTE COUNT

Project: BNSF-Skykomish

Pace Project No.: 257056

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
257056001	MW-16-0311	NWTPH-Dx	AY1	4	PASI-S
257056002	MW-160-0311	NWTPH-Dx	AY1	4	PASI-S
257056003	5-W-51-0311	NWTPH-Dx	AY1	4	PASI-S
257056004	1B-W-2-0311	NWTPH-Dx	DMT	4	PASI-S
257056005	2A-W-42-0311	NWTPH-Dx	DMT	4	PASI-S
257056006	5-W-55-0311	NWTPH-Dx	DMT	4	PASI-S
257056007	5-W-56-0311	NWTPH-Dx	DMT	4	PASI-S
257056008	2A-W-41-0311	NWTPH-Dx	DMT	4	PASI-S
257056009	GW-4-0311	NWTPH-Dx	DMT	4	PASI-S
257056010	MW-3-0311	NWTPH-Dx	DMT	4	PASI-S
257056011	MW-4-0311	NWTPH-Dx	DMT	4	PASI-S
257056012	2A-W-10-0311	NWTPH-Dx	DMT	4	PASI-S
257056013	2A-W-9-0311	NWTPH-Dx	DMT	4	PASI-S
257056014	1B-W-23-0311	NWTPH-Dx	DMT	4	PASI-S
257056015	1A-W-4-0311	NWTPH-Dx	DMT	4	PASI-S
257056016	2A-W-40-0311	NWTPH-Dx	DMT	4	PASI-S
257056017	2A-W-400-0311	NWTPH-Dx	DMT	4	PASI-S

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 257056

Sample: MW-16-0311		Lab ID: 257056001		Collected: 03/22/11 16:15		Received: 03/23/11 16:25		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.019	1	03/30/11 15:40	03/31/11 09:09		
Motor Oil Range		ND mg/L		0.095	1	03/30/11 15:40	03/31/11 09:09	64742-65-0	
n-Octacosane (S)		91 %		50-150	1	03/30/11 15:40	03/31/11 09:09	630-02-4	
o-Terphenyl (S)		86 %		50-150	1	03/30/11 15:40	03/31/11 09:09	84-15-1	

Sample: MW-160-0311		Lab ID: 257056002		Collected: 03/22/11 16:30		Received: 03/23/11 16:25		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.019	1	03/30/11 15:40	03/31/11 09:32		
Motor Oil Range		ND mg/L		0.095	1	03/30/11 15:40	03/31/11 09:32	64742-65-0	
n-Octacosane (S)		93 %		50-150	1	03/30/11 15:40	03/31/11 09:32	630-02-4	
o-Terphenyl (S)		87 %		50-150	1	03/30/11 15:40	03/31/11 09:32	84-15-1	

Sample: 5-W-51-0311		Lab ID: 257056003		Collected: 03/22/11 16:55		Received: 03/23/11 16:25		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		10.0 mg/L		0.095	5	03/30/11 15:40	03/31/11 18:42		
Motor Oil Range		8.7 mg/L		0.095	1	03/30/11 15:40	03/31/11 07:12	64742-65-0	
n-Octacosane (S)		101 %		50-150	1	03/30/11 15:40	03/31/11 07:12	630-02-4	
o-Terphenyl (S)		118 %		50-150	5	03/30/11 15:40	03/31/11 18:42	84-15-1	

Sample: 1B-W-2-0311		Lab ID: 257056004		Collected: 03/22/11 17:20		Received: 03/23/11 16:25		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.049	mg/L	0.021	1	04/01/11 11:05	04/04/11 14:17		
Motor Oil Range		ND	mg/L	0.11	1	04/01/11 11:05	04/04/11 14:17	64742-65-0	
n-Octacosane (S)		86	%	50-150	1	04/01/11 11:05	04/04/11 14:17	630-02-4	
o-Terphenyl (S)		84	%	50-150	1	04/01/11 11:05	04/04/11 14:17	84-15-1	

Sample: 2A-W-42-0311		Lab ID: 257056005		Collected: 03/22/11 16:35		Received: 03/23/11 16:25		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.14	mg/L	0.019	1	04/01/11 11:05	04/04/11 13:28		
Motor Oil Range		0.10	mg/L	0.096	1	04/01/11 11:05	04/04/11 13:28	64742-65-0	

Date: 04/06/2011 03:17 PM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 257056

<b>Sample: 2A-W-42-0311</b>	<b>Lab ID: 257056005</b>	Collected: 03/22/11 16:35	Received: 03/23/11 16:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

n-Octacosane (S)	85 %		50-150	1	04/01/11 11:05	04/04/11 13:28	630-02-4	
o-Terphenyl (S)	82 %		50-150	1	04/01/11 11:05	04/04/11 13:28	84-15-1	

<b>Sample: 5-W-55-0311</b>	<b>Lab ID: 257056006</b>	Collected: 03/23/11 10:05	Received: 03/23/11 16:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.14 mg/L		0.019	1	04/01/11 11:05	04/04/11 14:00		
Motor Oil Range	0.13 mg/L		0.096	1	04/01/11 11:05	04/04/11 14:00	64742-65-0	
n-Octacosane (S)	81 %		50-150	1	04/01/11 11:05	04/04/11 14:00	630-02-4	
o-Terphenyl (S)	77 %		50-150	1	04/01/11 11:05	04/04/11 14:00	84-15-1	

<b>Sample: 5-W-56-0311</b>	<b>Lab ID: 257056007</b>	Collected: 03/23/11 09:10	Received: 03/23/11 16:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	1.5 mg/L		0.019	1	04/01/11 11:05	04/04/11 15:22		
Motor Oil Range	1.0 mg/L		0.096	1	04/01/11 11:05	04/04/11 15:22	64742-65-0	
n-Octacosane (S)	102 %		50-150	1	04/01/11 11:05	04/04/11 15:22	630-02-4	
o-Terphenyl (S)	83 %		50-150	1	04/01/11 11:05	04/04/11 15:22	84-15-1	

<b>Sample: 2A-W-41-0311</b>	<b>Lab ID: 257056008</b>	Collected: 03/23/11 11:00	Received: 03/23/11 16:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.030 mg/L		0.019	1	04/01/11 11:05	04/04/11 13:11		
Motor Oil Range	ND mg/L		0.097	1	04/01/11 11:05	04/04/11 13:11	64742-65-0	
n-Octacosane (S)	85 %		50-150	1	04/01/11 11:05	04/04/11 13:11	630-02-4	
o-Terphenyl (S)	77 %		50-150	1	04/01/11 11:05	04/04/11 13:11	84-15-1	

<b>Sample: GW-4-0311</b>	<b>Lab ID: 257056009</b>	Collected: 03/23/11 08:50	Received: 03/23/11 16:25	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.069 mg/L		0.019	1	04/01/11 11:05	04/04/11 12:55		
Motor Oil Range	ND mg/L		0.095	1	04/01/11 11:05	04/04/11 12:55	64742-65-0	
n-Octacosane (S)	81 %		50-150	1	04/01/11 11:05	04/04/11 12:55	630-02-4	
o-Terphenyl (S)	80 %		50-150	1	04/01/11 11:05	04/04/11 12:55	84-15-1	

Date: 04/06/2011 03:17 PM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 257056

Sample: MW-3-0311		Lab ID: 257056010		Collected: 03/23/11 09:50		Received: 03/23/11 16:25		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.072	mg/L	0.019	1	04/01/11 11:05	04/04/11 13:44		
Motor Oil Range		0.12	mg/L	0.095	1	04/01/11 11:05	04/04/11 13:44	64742-65-0	
n-Octacosane (S)		84	%	50-150	1	04/01/11 11:05	04/04/11 13:44	630-02-4	
o-Terphenyl (S)		81	%	50-150	1	04/01/11 11:05	04/04/11 13:44	84-15-1	

Sample: MW-4-0311		Lab ID: 257056011		Collected: 03/23/11 10:35		Received: 03/23/11 16:25		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.13 mg/L		0.019	1	04/01/11 11:05	04/04/11 15:54		
Motor Oil Range		0.24 mg/L		0.095	1	04/01/11 11:05	04/04/11 15:54	64742-65-0	
n-Octacosane (S)		88 %		50-150	1	04/01/11 11:05	04/04/11 15:54	630-02-4	
o-Terphenyl (S)		88 %		50-150	1	04/01/11 11:05	04/04/11 15:54	84-15-1	

Sample: 2A-W-10-0311		Lab ID: 257056012		Collected: 03/23/11 11:00		Received: 03/23/11 16:25		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.16 mg/L		0.019	1	04/01/11 11:05	04/04/11 16:10		
Motor Oil Range		0.34 mg/L		0.095	1	04/01/11 11:05	04/04/11 16:10	64742-65-0	
n-Octacosane (S)		81 %		50-150	1	04/01/11 11:05	04/04/11 16:10	630-02-4	
o-Terphenyl (S)		79 %		50-150	1	04/01/11 11:05	04/04/11 16:10	84-15-1	

Sample: 2A-W-9-0311		Lab ID: 257056013		Collected: 03/23/11 12:05		Received: 03/23/11 16:25		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.40 mg/L		0.019	1	04/01/11 11:05	04/04/11 16:27		
Motor Oil Range		0.23 mg/L		0.095	1	04/01/11 11:05	04/04/11 16:27	64742-65-0	
n-Octacosane (S)		82 %		50-150	1	04/01/11 11:05	04/04/11 16:27	630-02-4	
o-Terphenyl (S)		82 %		50-150	1	04/01/11 11:05	04/04/11 16:27	84-15-1	

Sample: 1B-W-23-0311		Lab ID: 257056014		Collected: 03/23/11 12:35		Received: 03/23/11 16:25		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.042	mg/L	0.020	1	04/01/11 11:05	04/04/11 17:16		
Motor Oil Range		ND	mg/L	0.099	1	04/01/11 11:05	04/04/11 17:16	64742-65-0	

Date: 04/06/2011 03:17 PM

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 257056

Sample: 1B-W-23-0311		Lab ID: 257056014	Collected: 03/23/11 12:35	Received: 03/23/11 16:25	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

n-Octacosane (S)	82 %		50-150	1	04/01/11 11:05	04/04/11 17:16	630-02-4	
o-Terphenyl (S)	77 %		50-150	1	04/01/11 11:05	04/04/11 17:16	84-15-1	

Sample: 1A-W-4-0311		Lab ID: 257056015	Collected: 03/23/11 13:20	Received: 03/23/11 16:25	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	ND mg/L		0.020	1	04/01/11 11:05	04/04/11 18:21		
Motor Oil Range	ND mg/L		0.10	1	04/01/11 11:05	04/04/11 18:21	64742-65-0	
n-Octacosane (S)	80 %		50-150	1	04/01/11 11:05	04/04/11 18:21	630-02-4	
o-Terphenyl (S)	71 %		50-150	1	04/01/11 11:05	04/04/11 18:21	84-15-1	

Sample: 2A-W-40-0311		Lab ID: 257056016	Collected: 03/23/11 14:00	Received: 03/23/11 16:25	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	ND mg/L		0.019	1	04/01/11 11:05	04/04/11 17:32		
Motor Oil Range	ND mg/L		0.095	1	04/01/11 11:05	04/04/11 17:32	64742-65-0	
n-Octacosane (S)	81 %		50-150	1	04/01/11 11:05	04/04/11 17:32	630-02-4	
o-Terphenyl (S)	68 %		50-150	1	04/01/11 11:05	04/04/11 17:32	84-15-1	

Sample: 2A-W-400-0311		Lab ID: 257056017	Collected: 03/23/11 13:00	Received: 03/23/11 16:25	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	ND mg/L		0.019	1	04/01/11 11:05	04/04/11 16:43		
Motor Oil Range	ND mg/L		0.097	1	04/01/11 11:05	04/04/11 16:43	64742-65-0	
n-Octacosane (S)	86 %		50-150	1	04/01/11 11:05	04/04/11 16:43	630-02-4	
o-Terphenyl (S)	79 %		50-150	1	04/01/11 11:05	04/04/11 16:43	84-15-1	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 257056

QC Batch: OEXT/3492

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 257056001, 257056002, 257056003

METHOD BLANK: 64616

Matrix: Water

Associated Lab Samples: 257056001, 257056002, 257056003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	03/30/11 22:37	
Motor Oil Range	mg/L	ND	0.10	03/30/11 22:37	
n-Octacosane (S)	%	89	50-150	03/30/11 22:37	
o-Terphenyl (S)	%	80	50-150	03/30/11 22:37	

LABORATORY CONTROL SAMPLE: 64617

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	0.84	67	51-147	
Motor Oil Range	mg/L	1.2	0.96	77	20-160	
n-Octacosane (S)	%			87	50-150	
o-Terphenyl (S)	%			112	50-150	

SAMPLE DUPLICATE: 64618

Parameter	Units	257035001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND	.0062J		
Motor Oil Range	mg/L	ND	.036J		
n-Octacosane (S)	%	87	90	4	
o-Terphenyl (S)	%	80	84	4	

SAMPLE DUPLICATE: 64619

Parameter	Units	257035022 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.032	0.026	20	
Motor Oil Range	mg/L	ND	.064J		
n-Octacosane (S)	%	53	97	59	
o-Terphenyl (S)	%	52	90	54	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 257056

QC Batch:	OEXT/3507	Analysis Method:	NWTPH-Dx
QC Batch Method:	EPA 3510	Analysis Description:	NWTPH-Dx GCS
Associated Lab Samples:	257056004, 257056005, 257056006, 257056007, 257056008, 257056009, 257056010, 257056011, 257056012, 257056013, 257056014, 257056015, 257056016, 257056017		

METHOD BLANK: 65133 Matrix: Water

Associated Lab Samples: 257056004, 257056005, 257056006, 257056007, 257056008, 257056009, 257056010, 257056011, 257056012, 257056013, 257056014, 257056015, 257056016, 257056017

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	04/04/11 12:23	
Motor Oil Range	mg/L	ND	0.10	04/04/11 12:23	
n-Octacosane (S)	%	63	50-150	04/04/11 12:23	
o-Terphenyl (S)	%	56	50-150	04/04/11 12:23	

LABORATORY CONTROL SAMPLE: 65134

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	0.98	78	51-147	
Motor Oil Range	mg/L	1.2	1.2	95	20-160	
n-Octacosane (S)	%			88	50-150	
o-Terphenyl (S)	%			96	50-150	

SAMPLE DUPLICATE: 65135

Parameter	Units	257056004 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.049	0.034	37	
Motor Oil Range	mg/L	ND	.074J		
n-Octacosane (S)	%	86	63	33	
o-Terphenyl (S)	%	84	57	41	

SAMPLE DUPLICATE: 65136

Parameter	Units	257056017 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND	.018J		
Motor Oil Range	mg/L	ND	.045J		
n-Octacosane (S)	%	86	84	.7	
o-Terphenyl (S)	%	79	76	3	

## QUALIFIERS

Project: BNSF-Skykomish

Pace Project No.: 257056

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-S Pace Analytical Services - Seattle

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF-Skykomish

Pace Project No.: 257056

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
257056001	MW-16-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257056002	MW-160-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257056003	5-W-51-0311	EPA 3510	OEXT/3492	NWTPH-Dx	GCSV/2371
257056004	1B-W-2-0311	EPA 3510	OEXT/3507	NWTPH-Dx	GCSV/2379
257056005	2A-W-42-0311	EPA 3510	OEXT/3507	NWTPH-Dx	GCSV/2379
257056006	5-W-55-0311	EPA 3510	OEXT/3507	NWTPH-Dx	GCSV/2379
257056007	5-W-56-0311	EPA 3510	OEXT/3507	NWTPH-Dx	GCSV/2379
257056008	2A-W-41-0311	EPA 3510	OEXT/3507	NWTPH-Dx	GCSV/2379
257056009	GW-4-0311	EPA 3510	OEXT/3507	NWTPH-Dx	GCSV/2379
257056010	MW-3-0311	EPA 3510	OEXT/3507	NWTPH-Dx	GCSV/2379
257056011	MW-4-0311	EPA 3510	OEXT/3507	NWTPH-Dx	GCSV/2379
257056012	2A-W-10-0311	EPA 3510	OEXT/3507	NWTPH-Dx	GCSV/2379
257056013	2A-W-9-0311	EPA 3510	OEXT/3507	NWTPH-Dx	GCSV/2379
257056014	1B-W-23-0311	EPA 3510	OEXT/3507	NWTPH-Dx	GCSV/2379
257056015	1A-W-4-0311	EPA 3510	OEXT/3507	NWTPH-Dx	GCSV/2379
257056016	2A-W-40-0311	EPA 3510	OEXT/3507	NWTPH-Dx	GCSV/2379
257056017	2A-W-400-0311	EPA 3510	OEXT/3507	NWTPH-Dx	GCSV/2379



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

257056

## Section A

Required Client Information:

Company: BNSF

Address: \_\_\_\_\_

Email To: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Requested Due Date/TAT: std

## Section B

Required Project Information:

Report To: Sarah Albano

Copy To: Renee Knecht

Purchase Order No.: TT0100-J39

Project Name: BNSF-Skykomish

Project Number: 6019113

## Section C

Invoice Information:

Attention: Bruce Sheppard

Company Name: BNSF

Address: \_\_\_\_\_

Pace Quote Reference: \_\_\_\_\_

Pace Project Manager: \_\_\_\_\_

Pace Profile #: \_\_\_\_\_

Page: 1 of 2

**1468039**

## REGULATORY AGENCY


☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER  
☐ UST ☐ RCRA ☐ OTHER \_\_\_\_\_

Site Location

STATE: WA

## Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test ↓ NWTPH-DX (WFO SCAL)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other			
					DATE	TIME	DATE	TIME													
1	MW-16-0311						3/22/11	1615	6	2				X							
2	MW-160-							1630	6	2				X							
3	5-W-51-							1655	-	2				X							
4	1B-W-2-							1720	7	2				X							
5	2A-W-42-							1635	7	2				X							
6	5-W-55-						3/23/11	1005	6	2				X							
7	5-W-56-							0910	4	2				X							
8	2A-W-41-							1100	7	2				X							
9	GW-4-							0850	6	2				X							
10	MW-3-							0950	5	2				X							
11	MW-4-							1035	4	2				X							
12	<del>2A-W-9</del>							1100	4	2				X							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
		3/23/11	1625	Cathy Weaner / PACE	032311	1625	4.0	Y	N	Y
							3.9			
							5.7			
							5.1			

ORIGINAL

## SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER:

DATE Signed  
(MM/DD/YY):

Temp in °C  
Received on Ice (Y/N)  
Custody Sealed Cooler (Y/N)  
Samples Intact (Y/N)



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

257056

## Section A

Required Client Information:

Company: BNSF

Address: \_\_\_\_\_

Email To: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Requested Due Date/TAT: \_\_\_\_\_

## Section B

Required Project Information:

Report To: Sarah Albano

Copy To: Renee Knecht

Purchase Order No.: IT0100-J39

Project Name: BNSF-Skykomish

Project Number: 60191113

## Section C

Invoice Information:

Attention: Bruce Sheppard

Company Name: BNSF

Address: \_\_\_\_\_

Pace Quote Reference: \_\_\_\_\_

Pace Project Manager: \_\_\_\_\_

Pace Profile #: \_\_\_\_\_

Page: 2 of 2

**1468033**

## REGULATORY AGENCY

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER  
☐ UST ☐ RCRA ☐ OTHER \_\_\_\_\_

Site Location

STATE: WA

## Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test ↓	Y/N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
<u>w/ SGCH - without</u> <u>5/11 ca gel cleanup</u>	<u>RECEIVED BY</u>	<u>3/23/11</u>	<u>1625</u>	<u>Collette Weaver / PACE</u>	<u>032311</u>	<u>1625</u>	<u>4.0</u>	<u>Y</u>	<u>N</u>	<u>Y</u>
							<u>3.9</u>			
							<u>5.7</u>			
							<u>5.1</u>			

ORIGINAL

## SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER:

DATE Signed  
(MM/DD/YY):

Temp in °C  
Received on Ice (Y/N)  
Custody Sealed Cooler (Y/N)  
Samples Intact (Y/N)



# Sample Container Count

CLIENT:

AECOM

COC PAGE

1 of 2

COC ID#

1468039



257056

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU	Comments			
1		2													
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber voa vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFU	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		

# Sample Container Count

CLIENT:

AECOM



COC PAGE

2 of 2

COC ID#

1468033

257056

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU					Comments
1		2														
2		1														
3		1														
4		1														
5		1														
6																
7																
8																
9																
10																
11																
12																Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFU	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		





# Sample Condition Upon Receipt

Client Name: AECOM

Project # 257056

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace Other \_\_\_\_\_

Tracking #: \_\_\_\_\_

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No Seals intact: ☐ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other \_\_\_\_\_ Temp. Blank Yes ☒ No

Thermometer Used 132013 or 101731962 or 226099 Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 4.0, 3.9, 5.7, 5.1

Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: 032311 CW

Temp should be above freezing  $\leq 6^{\circ}\text{C}$

Comments:

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Follow Up / Hold Analysis Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	8.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	13.
-Includes date/time/ID/Analysis Matrix:	<u>WT</u>	
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G		Initial when completed _____ Lot # of added preservative _____
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blanks Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	17.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: Sarah Albano Date/Time: 3/26/11 1727

Comments/ Resolution: Emailed client regarding containers / COC discrepancy. Per client, use times on containers -

Project Manager Review:

ARB

Date: 3/26/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



May 02, 2011

Mark Havighorst  
AECOM - BNSF  
333 SW 5th Avenue, Suite 225  
Portland, OR 97204

RE: Project: BNSF-Skykomish  
Pace Project No.: 257465

Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,



Andy Brownfield

andy.brownfield@pacelabs.com  
Project Manager

Enclosures

cc: Sarah Albano, AECOM (BNSF)  
Paul Bianco, AECOM (BNSF)  
Renee Knecht, AECOM (BNSF)  
Jennifer Wald, AECOM (BNSF)

## REPORT OF LABORATORY ANALYSIS

Page 1 of 7

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## CERTIFICATIONS

Project: BNSF-Skykomish

Pace Project No.: 257465

### Washington Certification IDs

940 South Harney Street, Seattle, WA 98108

Alaska CS Certification #: UST-025

Alaska Drinking Water VOC Certification #: WA01230

Alaska Drinking Water Micro Certification #: WA01230

California Certification #: 01153CA

Florida/NELAP Certification #: E87617

Oregon Certification #: WA200007

Washington Certification #: C1229

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## REPORT OF LABORATORY ANALYSIS

Page 2 of 7

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## SAMPLE ANALYTE COUNT

Project: BNSF-Skykomish

Pace Project No.: 257465

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
257465001	IC-W-7-0411	NWTPH-Dx	AY1	4	PASI-S
257465002	IC-W-8-0411	NWTPH-Dx	AY1	4	PASI-S
257465003	IC-W-1-0411	NWTPH-Dx	AY1	4	PASI-S
257465004	IC-W-70-0411	NWTPH-Dx	AY1	4	PASI-S

## REPORT OF LABORATORY ANALYSIS

Page 3 of 7

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 257465

<b>Sample: IC-W-7-0411</b>		<b>Lab ID: 257465001</b>	Collected: 04/27/11 11:35	Received: 04/28/11 09:32	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.060</b>	mg/L	0.019	1	04/28/11 14:55	04/28/11 22:13		
Motor Oil Range	ND	mg/L	0.097	1	04/28/11 14:55	04/28/11 22:13	64742-65-0	
n-Octacosane (S)	80 %		50-150	1	04/28/11 14:55	04/28/11 22:13	630-02-4	
o-Terphenyl (S)	65 %		50-150	1	04/28/11 14:55	04/28/11 22:13	84-15-1	

<b>Sample: IC-W-8-0411</b>		<b>Lab ID: 257465002</b>	Collected: 04/27/11 14:00	Received: 04/28/11 09:32	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.37</b>	mg/L	0.021	1	04/28/11 14:55	04/28/11 23:18		
Motor Oil Range	<b>0.13</b>	mg/L	0.10	1	04/28/11 14:55	04/28/11 23:18	64742-65-0	
n-Octacosane (S)	96 %		50-150	1	04/28/11 14:55	04/28/11 23:18	630-02-4	
o-Terphenyl (S)	89 %		50-150	1	04/28/11 14:55	04/28/11 23:18	84-15-1	

<b>Sample: IC-W-1-0411</b>		<b>Lab ID: 257465003</b>	Collected: 04/27/11 13:20	Received: 04/28/11 09:32	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.048</b>	mg/L	0.021	1	04/28/11 14:55	04/29/11 00:06		
Motor Oil Range	ND	mg/L	0.10	1	04/28/11 14:55	04/29/11 00:06	64742-65-0	
n-Octacosane (S)	79 %		50-150	1	04/28/11 14:55	04/29/11 00:06	630-02-4	
o-Terphenyl (S)	68 %		50-150	1	04/28/11 14:55	04/29/11 00:06	84-15-1	

<b>Sample: IC-W-70-0411</b>		<b>Lab ID: 257465004</b>	Collected: 04/27/11 10:35	Received: 04/28/11 09:32	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.070</b>	mg/L	0.019	1	04/28/11 14:55	04/29/11 00:22		
Motor Oil Range	ND	mg/L	0.095	1	04/28/11 14:55	04/29/11 00:22	64742-65-0	
n-Octacosane (S)	89 %		50-150	1	04/28/11 14:55	04/29/11 00:22	630-02-4	
o-Terphenyl (S)	73 %		50-150	1	04/28/11 14:55	04/29/11 00:22	84-15-1	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 257465

QC Batch: OEXT/3636

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 257465001, 257465002, 257465003, 257465004

METHOD BLANK: 68249

Matrix: Water

Associated Lab Samples: 257465001, 257465002, 257465003, 257465004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	04/28/11 21:40	
Motor Oil Range	mg/L	ND	0.10	04/28/11 21:40	
n-Octacosane (S)	%	96	50-150	04/28/11 21:40	
o-Terphenyl (S)	%	83	50-150	04/28/11 21:40	

LABORATORY CONTROL SAMPLE: 68250

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	1.1	85	51-147	
Motor Oil Range	mg/L	1.2	1.2	93	20-160	
n-Octacosane (S)	%			113	50-150	
o-Terphenyl (S)	%			115	50-150	

SAMPLE DUPLICATE: 68251

Parameter	Units	257465001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.060	0.065	8	
Motor Oil Range	mg/L	ND	.033J		
n-Octacosane (S)	%	80	82	2	
o-Terphenyl (S)	%	65	69	6	



## QUALIFIERS

Project: BNSF-Skykomish

Pace Project No.: 257465

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-S Pace Analytical Services - Seattle

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF-Skykomish

Pace Project No.: 257465

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
257465001	IC-W-7-0411	EPA 3510	OEXT/3636	NWTPH-Dx	GCSV/2458
257465002	IC-W-8-0411	EPA 3510	OEXT/3636	NWTPH-Dx	GCSV/2458
257465003	IC-W-1-0411	EPA 3510	OEXT/3636	NWTPH-Dx	GCSV/2458
257465004	IC-W-70-0411	EPA 3510	OEXT/3636	NWTPH-Dx	GCSV/2458





CLIENT:

AECOM

COC PAGE

of

COC ID#

1 of 1  
1470737

257465

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU					Comments
1		222														
2		↓														
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber voa vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFU	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		

**Sample Condition Upon Receipt**Client Name: AECOMProject # 257465Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace Other \_\_\_\_\_

Tracking #: \_\_\_\_\_

Custody Seal on Cooler/Box Present: ☒ Yes ☐ No Seals intact: ☒ Yes ☐ NoPacking Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other \_\_\_\_\_ Temp. Blank ☒ Yes ☐ NoThermometer Used 132013 or 101731962 or 226099 Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begunCooler Temperature 5.8°C

Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: BS 04/28/11Temp should be above freezing  $\leq 6^{\circ}\text{C}$ 

Comments:

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Follow Up / Hold Analysis Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	8.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample Labels match COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
-Includes date/time/ID/Analysis Matrix: <u>Water</u>		
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G		Initial when completed
		Lot # of added preservative
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blanks Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	17.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required?

Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: ARBDate: 4/28/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



May 31, 2011

Mark Havighorst  
AECOM - BNSF  
333 SW 5th Avenue, Suite 225  
Portland, OR 97204

RE: Project: BNSF- Skykomish  
Pace Project No.: 257749

Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on May 19, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,



Andy Brownfield

andy.brownfield@pacelabs.com  
Project Manager

Enclosures

cc: Sarah Albano, AECOM (BNSF)  
Paul Bianco, AECOM (BNSF)  
Renee Knecht, AECOM (BNSF)  
Jennifer Wald, AECOM (BNSF)

## REPORT OF LABORATORY ANALYSIS

Page 1 of 7

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## CERTIFICATIONS

Project: BNSF- Skykomish

Pace Project No.: 257749

### Washington Certification IDs

940 South Harney Street, Seattle, WA 98108

Alaska CS Certification #: UST-025

Alaska Drinking Water VOC Certification #: WA01230

Alaska Drinking Water Micro Certification #: WA01230

California Certification #: 01153CA

Florida/NELAP Certification #: E87617

Oregon Certification #: WA200007

Washington Certification #: C1229

---

## REPORT OF LABORATORY ANALYSIS

Page 2 of 7

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## SAMPLE ANALYTE COUNT

Project: BNSF- Skykomish

Pace Project No.: 257749

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
257749001	IC-W-1-0511	NWTPH-Dx	AY1	4	PASI-S
257749002	IC-W-8-0511	NWTPH-Dx	AY1	4	PASI-S
257749003	IC-W-7-0511	NWTPH-Dx	AY1	4	PASI-S
257749004	IC-W-70-0511	NWTPH-Dx	AY1	4	PASI-S

## REPORT OF LABORATORY ANALYSIS

Page 3 of 7

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## ANALYTICAL RESULTS

Project: BNSF- Skykomish

Pace Project No.: 257749

<b>Sample: IC-W-1-0511</b>		<b>Lab ID: 257749001</b>	Collected: 05/19/11 10:50	Received: 05/19/11 15:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.019</b>	mg/L	0.019	1	05/25/11 15:10	05/25/11 18:57		
Motor Oil Range	ND	mg/L	0.095	1	05/25/11 15:10	05/25/11 18:57	64742-65-0	
n-Octacosane (S)	84 %		50-150	1	05/25/11 15:10	05/25/11 18:57	630-02-4	
o-Terphenyl (S)	80 %		50-150	1	05/25/11 15:10	05/25/11 18:57	84-15-1	

<b>Sample: IC-W-8-0511</b>		<b>Lab ID: 257749002</b>	Collected: 05/19/11 11:25	Received: 05/19/11 15:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.24</b>	mg/L	0.019	1	05/25/11 15:10	05/25/11 19:30		
Motor Oil Range	<b>0.11</b>	mg/L	0.095	1	05/25/11 15:10	05/25/11 19:30	64742-65-0	
n-Octacosane (S)	88 %		50-150	1	05/25/11 15:10	05/25/11 19:30	630-02-4	
o-Terphenyl (S)	84 %		50-150	1	05/25/11 15:10	05/25/11 19:30	84-15-1	

<b>Sample: IC-W-7-0511</b>		<b>Lab ID: 257749003</b>	Collected: 05/19/11 12:35	Received: 05/19/11 15:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.086</b>	mg/L	0.019	1	05/25/11 15:10	05/25/11 19:46		
Motor Oil Range	ND	mg/L	0.095	1	05/25/11 15:10	05/25/11 19:46	64742-65-0	
n-Octacosane (S)	94 %		50-150	1	05/25/11 15:10	05/25/11 19:46	630-02-4	
o-Terphenyl (S)	86 %		50-150	1	05/25/11 15:10	05/25/11 19:46	84-15-1	

<b>Sample: IC-W-70-0511</b>		<b>Lab ID: 257749004</b>	Collected: 05/19/11 12:45	Received: 05/19/11 15:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.072</b>	mg/L	0.019	1	05/25/11 15:10	05/25/11 20:02		
Motor Oil Range	ND	mg/L	0.095	1	05/25/11 15:10	05/25/11 20:02	64742-65-0	
n-Octacosane (S)	79 %		50-150	1	05/25/11 15:10	05/25/11 20:02	630-02-4	
o-Terphenyl (S)	71 %		50-150	1	05/25/11 15:10	05/25/11 20:02	84-15-1	

## QUALITY CONTROL DATA

Project: BNSF- Skykomish

Pace Project No.: 257749

QC Batch: OEXT/3763

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 257749001, 257749002, 257749003, 257749004

METHOD BLANK: 71889

Matrix: Water

Associated Lab Samples: 257749001, 257749002, 257749003, 257749004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	05/25/11 18:25	
Motor Oil Range	mg/L	ND	0.10	05/25/11 18:25	
n-Octacosane (S)	%	94	50-150	05/25/11 18:25	
o-Terphenyl (S)	%	90	50-150	05/25/11 18:25	

LABORATORY CONTROL SAMPLE: 71890

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	0.99	79	51-147	
Motor Oil Range	mg/L	1.2	1.1	88	20-160	
n-Octacosane (S)	%			95	50-150	
o-Terphenyl (S)	%			86	50-150	

SAMPLE DUPLICATE: 71891

Parameter	Units	257749001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.019	0.019	.5	
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	84	88	4	
o-Terphenyl (S)	%	80	82	2	



## QUALIFIERS

Project: BNSF- Skykomish

Pace Project No.: 257749

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-S Pace Analytical Services - Seattle

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF- Skykomish

Pace Project No.: 257749

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
257749001	IC-W-1-0511	EPA 3510	OEXT/3763	NWTPH-Dx	GCSV/2530
257749002	IC-W-8-0511	EPA 3510	OEXT/3763	NWTPH-Dx	GCSV/2530
257749003	IC-W-7-0511	EPA 3510	OEXT/3763	NWTPH-Dx	GCSV/2530
257749004	IC-W-70-0511	EPA 3510	OEXT/3763	NWTPH-Dx	GCSV/2530

257749

F-ALL-Q-020rev.07, 15-May-2007



# Sample Container Count

CLIENT:

BNSF



COC PAGE

1 of 1

COC ID#

1469801

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU				Comments
1		242													
2		242													
3		242													
4		242													
5															
6															
7															
8															
9															
10															
11															
12															Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber voa vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFU	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		

257749



## Sample Condition Upon Receipt

Client Name: BNSF

Project # \_\_\_\_\_

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace Other \_\_\_\_\_

Tracking #: \_\_\_\_\_

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No Seals intact: ☐ Yes ☐ NoPacking Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other \_\_\_\_\_ Temp. Blank ☒ Yes ☐ NoThermometer Used 132013 or 101731962 or 226099 Type of Ice: ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begunCooler Temperature 6.8°C

Biological Tissue is Frozen: Yes No

Date and initials of person examining contents: NSS 5/19/11Temp should be above freezing  $\leq 6^{\circ}\text{C}$ 

Comments:

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Follow Up / Hold Analysis Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	8.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample Labels match COC:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
-Includes date/time/ID/Analysis Matrix: <u>Water</u>		
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G		
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Headspace in VOA Vials (>5mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blanks Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	17.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required?

Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: ARBDate: 5/20/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



July 08, 2011

Mark Havighorst  
AECOM - BNSF  
333 SW 5th Avenue, Suite 225  
Portland, OR 97204

RE: Project: BNSF-Skykomish 6019113  
Pace Project No.: 258246

Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on June 23, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,



Andy Brownfield

andy.brownfield@pacelabs.com  
Project Manager

Enclosures

cc: Renee Knecht, AECOM (BNSF)  
Jennifer Wald, AECOM (BNSF)

## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: BNSF-Skykomish 6019113

Pace Project No.: 258246

### Washington Certification IDs

940 South Harney Street, Seattle, WA 98108

Alaska CS Certification #: UST-025

Alaska Drinking Water VOC Certification #: WA01230

Alaska Drinking Water Micro Certification #: WA01230

California Certification #: 01153CA

Florida/NELAP Certification #: E87617

Oregon Certification #: WA200007

Washington Certification #: C1229

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE ANALYTE COUNT

Project: BNSF-Skykomish 6019113

Pace Project No.: 258246

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
258246001	2B-W-4-0611	NWTPH-Dx	DMT	4	PASI-S
258246002	GW-1-0611	NWTPH-Dx	DMT	4	PASI-S
258246003	5-W-43-0611	NWTPH-Dx	DMT	4	PASI-S
258246004	GW-2-0611	NWTPH-Dx	DMT	4	PASI-S
258246005	GW-3-0611	NWTPH-Dx	DMT	4	PASI-S
258246006	2A-W-41-0611	NWTPH-Dx	AY1	4	PASI-S
258246007	2A-W-42-0611	NWTPH-Dx	DMT	4	PASI-S
258246008	GW-4-0611	NWTPH-Dx	DMT	4	PASI-S
258246009	EW-2A-0611	NWTPH-Dx	AY1	4	PASI-S
258246010	IC-W-1-0611	NWTPH-Dx	DMT	4	PASI-S
258246011	IC-W-7-0611	NWTPH-Dx	DMT	4	PASI-S
258246012	IC-W-8-0611	NWTPH-Dx	DMT	4	PASI-S
258246013	5-W-14-0611	NWTPH-Dx	AY1	4	PASI-S
258246014	5-W-17-0611	NWTPH-Dx	DMT	4	PASI-S
		NWTPH-Dx	DMT	4	PASI-S
		NWTPH-Dx	DMT	4	PASI-S
258246015	5-W-15-0611	NWTPH-Dx	DMT	4	PASI-S
		NWTPH-Dx	DMT	4	PASI-S
258246016	5-W-150-0611	NWTPH-Dx	DMT	4	PASI-S
		NWTPH-Dx	DMT	4	PASI-S
258246017	5-W-19-0611	NWTPH-Dx	DMT	4	PASI-S
		NWTPH-Dx	DMT	4	PASI-S
258246018	5-W-18-0611	NWTPH-Dx	DMT	4	PASI-S
		NWTPH-Dx	DMT	4	PASI-S
258246019	5-W-16-0611	NWTPH-Dx	DMT	4	PASI-S
		NWTPH-Dx	DMT	4	PASI-S
258246020	2A-W-9-0611	NWTPH-Dx	DMT	4	PASI-S
258246021	2A-W-10-0611	NWTPH-Dx	DMT	4	PASI-S
258246022	2A-W-100-0611	NWTPH-Dx	DMT	4	PASI-S
258246023	1B-W-23	NWTPH-Dx	DMT	4	PASI-S
258246024	2A-W-40-0611	NWTPH-Dx	DMT	4	PASI-S
258246025	2A-W-400-0611	NWTPH-Dx	DMT	4	PASI-S
258246026	EW-1-0611	NWTPH-Dx	DMT	4	PASI-S
258246027	MW-3-0611	NWTPH-Dx	DMT	4	PASI-S
258246028	MW-4-0611	NWTPH-Dx	DMT	4	PASI-S

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish 6019113

Pace Project No.: 258246

<b>Sample: 2B-W-4-0611</b>		<b>Lab ID: 258246001</b>	Collected: 06/21/11 12:25	Received: 06/23/11 07:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.019	1	06/28/11 10:35	07/01/11 22:21		
Motor Oil Range	ND	mg/L	0.095	1	06/28/11 10:35	07/01/11 22:21	64742-65-0	
n-Octacosane (S)	70 %		50-150	1	06/28/11 10:35	07/01/11 22:21	630-02-4	
o-Terphenyl (S)	64 %		50-150	1	06/28/11 10:35	07/01/11 22:21	84-15-1	

<b>Sample: GW-1-0611</b>		<b>Lab ID: 258246002</b>	Collected: 06/21/11 13:20	Received: 06/23/11 07:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.019	1	06/28/11 10:35	07/01/11 23:26		
Motor Oil Range	ND	mg/L	0.095	1	06/28/11 10:35	07/01/11 23:26	64742-65-0	
n-Octacosane (S)	54 %		50-150	1	06/28/11 10:35	07/01/11 23:26	630-02-4	
o-Terphenyl (S)	50 %		50-150	1	06/28/11 10:35	07/01/11 23:26	84-15-1	

<b>Sample: 5-W-43-0611</b>		<b>Lab ID: 258246003</b>	Collected: 06/21/11 14:05	Received: 06/23/11 07:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.019	1	06/28/11 10:35	07/01/11 23:42		
Motor Oil Range	ND	mg/L	0.095	1	06/28/11 10:35	07/01/11 23:42	64742-65-0	
n-Octacosane (S)	63 %		50-150	1	06/28/11 10:35	07/01/11 23:42	630-02-4	
o-Terphenyl (S)	52 %		50-150	1	06/28/11 10:35	07/01/11 23:42	84-15-1	

<b>Sample: GW-2-0611</b>		<b>Lab ID: 258246004</b>	Collected: 06/21/11 14:45	Received: 06/23/11 07:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.053</b>	mg/L	0.019	1	06/28/11 10:35	07/01/11 23:58		
Motor Oil Range	ND	mg/L	0.094	1	06/28/11 10:35	07/01/11 23:58	64742-65-0	
n-Octacosane (S)	74 %		50-150	1	06/28/11 10:35	07/01/11 23:58	630-02-4	
o-Terphenyl (S)	69 %		50-150	1	06/28/11 10:35	07/01/11 23:58	84-15-1	

<b>Sample: GW-3-0611</b>		<b>Lab ID: 258246005</b>	Collected: 06/21/11 15:45	Received: 06/23/11 07:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.032</b>	mg/L	0.019	1	06/28/11 10:35	07/02/11 00:15		
Motor Oil Range	ND	mg/L	0.094	1	06/28/11 10:35	07/02/11 00:15	64742-65-0	

Date: 07/08/2011 01:46 PM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish 6019113

Pace Project No.: 258246

Sample: GW-3-0611		Lab ID: 258246005		Collected: 06/21/11 15:45		Received: 06/23/11 07:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
n-Octacosane (S)		71 %		50-150	1	06/28/11 10:35	07/02/11 00:15	630-02-4	
o-Terphenyl (S)		67 %		50-150	1	06/28/11 10:35	07/02/11 00:15	84-15-1	

Sample: 2A-W-41-0611		Lab ID: 258246006		Collected: 06/21/11 16:30		Received: 06/23/11 07:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.026 mg/L		0.019	1	07/05/11 15:10	07/05/11 19:33		
Motor Oil Range		ND mg/L		0.095	1	07/05/11 15:10	07/05/11 19:33	64742-65-0	
n-Octacosane (S)		93 %		50-150	1	07/05/11 15:10	07/05/11 19:33	630-02-4	
o-Terphenyl (S)		79 %		50-150	1	07/05/11 15:10	07/05/11 19:33	84-15-1	

Sample: 2A-W-42-0611		Lab ID: 258246007		Collected: 06/21/11 15:35		Received: 06/23/11 07:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.065 mg/L		0.019	1	06/28/11 10:35	07/02/11 00:47		
Motor Oil Range		ND mg/L		0.094	1	06/28/11 10:35	07/02/11 00:47	64742-65-0	
n-Octacosane (S)		71 %		50-150	1	06/28/11 10:35	07/02/11 00:47	630-02-4	
o-Terphenyl (S)		69 %		50-150	1	06/28/11 10:35	07/02/11 00:47	84-15-1	

Sample: GW-4-0611		Lab ID: 258246008		Collected: 06/21/11 16:20		Received: 06/23/11 07:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.019	mg/L	0.019	1	06/28/11 10:35	07/02/11 01:04		
Motor Oil Range		ND	mg/L	0.094	1	06/28/11 10:35	07/02/11 01:04	64742-65-0	
n-Octacosane (S)		75	%	50-150	1	06/28/11 10:35	07/02/11 01:04	630-02-4	
o-Terphenyl (S)		72	%	50-150	1	06/28/11 10:35	07/02/11 01:04	84-15-1	

Sample: EW-2A-0611		Lab ID: 258246009		Collected: 06/21/11 17:10		Received: 06/23/11 07:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.019	1	07/05/11 15:10	07/05/11 19:49		
Motor Oil Range		ND mg/L		0.095	1	07/05/11 15:10	07/05/11 19:49	64742-65-0	
n-Octacosane (S)		91 %		50-150	1	07/05/11 15:10	07/05/11 19:49	630-02-4	
o-Terphenyl (S)		80 %		50-150	1	07/05/11 15:10	07/05/11 19:49	84-15-1	

Date: 07/08/2011 01:46 PM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish 6019113

Pace Project No.: 258246

Sample: IC-W-1-0611		Lab ID: 258246010	Collected: 06/22/11 09:15	Received: 06/23/11 07:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.025	mg/L	0.019	1	06/28/11 10:35	07/02/11 02:09		
Motor Oil Range	ND	mg/L	0.094	1	06/28/11 10:35	07/02/11 02:09	64742-65-0	
n-Octacosane (S)	79	%	50-150	1	06/28/11 10:35	07/02/11 02:09	630-02-4	
o-Terphenyl (S)	73	%	50-150	1	06/28/11 10:35	07/02/11 02:09	84-15-1	

Sample: IC-W-7-0611		Lab ID: 258246011	Collected: 06/22/11 10:50	Received: 06/23/11 07:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.066	mg/L	0.019	1	06/28/11 10:35	07/02/11 02:25		
Motor Oil Range	ND	mg/L	0.094	1	06/28/11 10:35	07/02/11 02:25	64742-65-0	
n-Octacosane (S)	85	%	50-150	1	06/28/11 10:35	07/02/11 02:25	630-02-4	
o-Terphenyl (S)	73	%	50-150	1	06/28/11 10:35	07/02/11 02:25	84-15-1	

Sample: IC-W-8-0611		Lab ID: 258246012	Collected: 06/22/11 09:55	Received: 06/23/11 07:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.15	mg/L	0.019	1	06/28/11 10:35	07/02/11 02:41		
Motor Oil Range	ND	mg/L	0.094	1	06/28/11 10:35	07/02/11 02:41	64742-65-0	
n-Octacosane (S)	71	%	50-150	1	06/28/11 10:35	07/02/11 02:41	630-02-4	
o-Terphenyl (S)	68	%	50-150	1	06/28/11 10:35	07/02/11 02:41	84-15-1	

Sample: 5-W-14-0611		Lab ID: 258246013	Collected: 06/22/11 09:20	Received: 06/23/11 07:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.019	1	07/05/11 15:10	07/05/11 20:06		
Motor Oil Range	ND	mg/L	0.095	1	07/05/11 15:10	07/05/11 20:06	64742-65-0	
n-Octacosane (S)	88	%	50-150	1	07/05/11 15:10	07/05/11 20:06	630-02-4	
o-Terphenyl (S)	82	%	50-150	1	07/05/11 15:10	07/05/11 20:06	84-15-1	

<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND	mg/L	0.019	1	06/27/11 15:10	07/05/11 01:18		
Motor Oil Range SG	ND	mg/L	0.095	1	06/27/11 15:10	07/05/11 01:18	64742-65-0	
n-Octacosane (S) SG	93	%	50-150	1	06/27/11 15:10	07/05/11 01:18	630-02-4	
o-Terphenyl (S) SG	85	%	50-150	1	06/27/11 15:10	07/05/11 01:18	84-15-1	



## ANALYTICAL RESULTS

Project: BNSF-Skykomish 6019113

Pace Project No.: 258246

Sample: 5-W-17-0611		Lab ID: 258246014	Collected: 06/22/11 10:00	Received: 06/23/11 07:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.019	1	06/28/11 10:35	07/02/11 03:30		
Motor Oil Range	ND	mg/L	0.094	1	06/28/11 10:35	07/02/11 03:30	64742-65-0	
n-Octacosane (S)	65 %		50-150	1	06/28/11 10:35	07/02/11 03:30	630-02-4	
o-Terphenyl (S)	56 %		50-150	1	06/28/11 10:35	07/02/11 03:30	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND	mg/L	0.019	1	06/27/11 15:10	07/05/11 01:34		
Motor Oil Range SG	ND	mg/L	0.095	1	06/27/11 15:10	07/05/11 01:34	64742-65-0	
n-Octacosane (S) SG	83 %		50-150	1	06/27/11 15:10	07/05/11 01:34	630-02-4	
o-Terphenyl (S) SG	75 %		50-150	1	06/27/11 15:10	07/05/11 01:34	84-15-1	

Sample: 5-W-15-0611		Lab ID: 258246015	Collected: 06/22/11 10:35	Received: 06/23/11 07:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.28	mg/L	0.019	1	06/28/11 10:35	07/02/11 03:46		
Motor Oil Range	0.19	mg/L	0.094	1	06/28/11 10:35	07/02/11 03:46	64742-65-0	
n-Octacosane (S)	70 %		50-150	1	06/28/11 10:35	07/02/11 03:46	630-02-4	
o-Terphenyl (S)	68 %		50-150	1	06/28/11 10:35	07/02/11 03:46	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	0.053	mg/L	0.019	1	06/27/11 15:10	07/05/11 01:50		
Motor Oil Range SG	ND	mg/L	0.095	1	06/27/11 15:10	07/05/11 01:50	64742-65-0	
n-Octacosane (S) SG	87 %		50-150	1	06/27/11 15:10	07/05/11 01:50	630-02-4	
o-Terphenyl (S) SG	86 %		50-150	1	06/27/11 15:10	07/05/11 01:50	84-15-1	

Sample: 5-W-150-0611		Lab ID: 258246016	Collected: 06/22/11 10:50	Received: 06/23/11 07:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.27	mg/L	0.019	1	06/28/11 15:10	07/02/11 05:06		
Motor Oil Range	0.19	mg/L	0.095	1	06/28/11 15:10	07/02/11 05:06	64742-65-0	
n-Octacosane (S)	77 %		50-150	1	06/28/11 15:10	07/02/11 05:06	630-02-4	
o-Terphenyl (S)	77 %		50-150	1	06/28/11 15:10	07/02/11 05:06	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	0.061	mg/L	0.019	1	06/27/11 15:10	07/05/11 02:06		
Motor Oil Range SG	ND	mg/L	0.095	1	06/27/11 15:10	07/05/11 02:06	64742-65-0	
n-Octacosane (S) SG	80 %		50-150	1	06/27/11 15:10	07/05/11 02:06	630-02-4	
o-Terphenyl (S) SG	78 %		50-150	1	06/27/11 15:10	07/05/11 02:06	84-15-1	

## ANALYTICAL RESULTS

Project: BNSF-Skykomish 6019113

Pace Project No.: 258246

Sample: 5-W-19-0611		Lab ID: 258246017	Collected: 06/22/11 12:35	Received: 06/23/11 07:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND mg/L		0.019	1	06/28/11 15:10	07/02/11 05:22		
Motor Oil Range	ND mg/L		0.095	1	06/28/11 15:10	07/02/11 05:22	64742-65-0	
n-Octacosane (S)	87 %		50-150	1	06/28/11 15:10	07/02/11 05:22	630-02-4	
o-Terphenyl (S)	81 %		50-150	1	06/28/11 15:10	07/02/11 05:22	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND mg/L		0.019	1	06/27/11 15:10	07/05/11 02:22		
Motor Oil Range SG	ND mg/L		0.095	1	06/27/11 15:10	07/05/11 02:22	64742-65-0	
n-Octacosane (S) SG	77 %		50-150	1	06/27/11 15:10	07/05/11 02:22	630-02-4	
o-Terphenyl (S) SG	69 %		50-150	1	06/27/11 15:10	07/05/11 02:22	84-15-1	

Sample: 5-W-18-0611		Lab ID: 258246018	Collected: 06/22/11 13:15	Received: 06/23/11 07:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.20 mg/L		0.019	1	06/28/11 15:10	07/02/11 05:38		
Motor Oil Range	0.14 mg/L		0.095	1	06/28/11 15:10	07/02/11 05:38	64742-65-0	
n-Octacosane (S)	79 %		50-150	1	06/28/11 15:10	07/02/11 05:38	630-02-4	
o-Terphenyl (S)	78 %		50-150	1	06/28/11 15:10	07/02/11 05:38	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	0.031 mg/L		0.019	1	06/27/11 15:10	07/05/11 02:38		
Motor Oil Range SG	ND mg/L		0.095	1	06/27/11 15:10	07/05/11 02:38	64742-65-0	
n-Octacosane (S) SG	79 %		50-150	1	06/27/11 15:10	07/05/11 02:38	630-02-4	
o-Terphenyl (S) SG	77 %		50-150	1	06/27/11 15:10	07/05/11 02:38	84-15-1	

Sample: 5-W-16-0611		Lab ID: 258246019	Collected: 06/22/11 13:50	Received: 06/23/11 07:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND mg/L		0.019	1	06/28/11 15:10	07/02/11 06:58		
Motor Oil Range	ND mg/L		0.095	1	06/28/11 15:10	07/02/11 06:58	64742-65-0	
n-Octacosane (S)	78 %		50-150	1	06/28/11 15:10	07/02/11 06:58	630-02-4	
o-Terphenyl (S)	72 %		50-150	1	06/28/11 15:10	07/02/11 06:58	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND mg/L		0.019	1	06/27/11 15:10	07/05/11 03:42		
Motor Oil Range SG	ND mg/L		0.095	1	06/27/11 15:10	07/05/11 03:42	64742-65-0	
n-Octacosane (S) SG	85 %		50-150	1	06/27/11 15:10	07/05/11 03:42	630-02-4	
o-Terphenyl (S) SG	82 %		50-150	1	06/27/11 15:10	07/05/11 03:42	84-15-1	

## ANALYTICAL RESULTS

Project: BNSF-Skykomish 6019113

Pace Project No.: 258246

<b>Sample: 2A-W-9-0611</b>		<b>Lab ID: 258246020</b>	Collected: 06/22/11 15:05		Received: 06/23/11 07:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b> Analytical Method: NWTPH-Dx Preparation Method: EPA 3510								
Diesel Range	0.19	mg/L	0.019	1	06/28/11 15:10	07/02/11 07:14		
Motor Oil Range	0.11	mg/L	0.095	1	06/28/11 15:10	07/02/11 07:14	64742-65-0	
n-Octacosane (S)	66	%	50-150	1	06/28/11 15:10	07/02/11 07:14	630-02-4	
o-Terphenyl (S)	65	%	50-150	1	06/28/11 15:10	07/02/11 07:14	84-15-1	

<b>Sample: 2A-W-10-0611</b>		<b>Lab ID: 258246021</b>	Collected: 06/22/11 15:25		Received: 06/23/11 07:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b> Analytical Method: NWTPH-Dx Preparation Method: EPA 3510								
Diesel Range	0.14	mg/L	0.019	1	06/28/11 15:10	07/02/11 08:02		
Motor Oil Range	0.32	mg/L	0.095	1	06/28/11 15:10	07/02/11 08:02	64742-65-0	
n-Octacosane (S)	77	%	50-150	1	06/28/11 15:10	07/02/11 08:02	630-02-4	
o-Terphenyl (S)	77	%	50-150	1	06/28/11 15:10	07/02/11 08:02	84-15-1	

<b>Sample: 2A-W-100-0611</b>		<b>Lab ID: 258246022</b>	Collected: 06/22/11 15:40		Received: 06/23/11 07:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b> Analytical Method: NWTPH-Dx Preparation Method: EPA 3510								
Diesel Range	0.15	mg/L	0.019	1	06/28/11 15:10	07/02/11 08:18		
Motor Oil Range	0.36	mg/L	0.095	1	06/28/11 15:10	07/02/11 08:18	64742-65-0	
n-Octacosane (S)	80	%	50-150	1	06/28/11 15:10	07/02/11 08:18	630-02-4	
o-Terphenyl (S)	79	%	50-150	1	06/28/11 15:10	07/02/11 08:18	84-15-1	

<b>Sample: 1B-W-23</b>		<b>Lab ID: 258246023</b>	Collected: 06/22/11 12:00		Received: 06/23/11 07:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b> Analytical Method: NWTPH-Dx Preparation Method: EPA 3510								
Diesel Range	ND	mg/L	0.019	1	06/28/11 15:10	07/02/11 08:34		
Motor Oil Range	ND	mg/L	0.095	1	06/28/11 15:10	07/02/11 08:34	64742-65-0	
n-Octacosane (S)	62	%	50-150	1	06/28/11 15:10	07/02/11 08:34	630-02-4	
o-Terphenyl (S)	58	%	50-150	1	06/28/11 15:10	07/02/11 08:34	84-15-1	

<b>Sample: 2A-W-40-0611</b>		<b>Lab ID: 258246024</b>	Collected: 06/22/11 14:00		Received: 06/23/11 07:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b> Analytical Method: NWTPH-Dx Preparation Method: EPA 3510								
Diesel Range	ND	mg/L	0.019	1	06/28/11 15:10	07/02/11 08:50		
Motor Oil Range	ND	mg/L	0.095	1	06/28/11 15:10	07/02/11 08:50	64742-65-0	

Date: 07/08/2011 01:46 PM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish 6019113

Pace Project No.: 258246

<b>Sample: 2A-W-40-0611</b>		<b>Lab ID: 258246024</b>	Collected: 06/22/11 14:00		Received: 06/23/11 07:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
n-Octacosane (S)	67 %		50-150	1	06/28/11 15:10	07/02/11 08:50	630-02-4	
o-Terphenyl (S)	63 %		50-150	1	06/28/11 15:10	07/02/11 08:50	84-15-1	

<b>Sample: 2A-W-400-0611</b>		<b>Lab ID: 258246025</b>	Collected: 06/22/11 14:30		Received: 06/23/11 07:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND mg/L		0.019	1	06/28/11 15:10	07/02/11 09:06		
Motor Oil Range	ND mg/L		0.095	1	06/28/11 15:10	07/02/11 09:06	64742-65-0	
n-Octacosane (S)	81 %		50-150	1	06/28/11 15:10	07/02/11 09:06	630-02-4	
o-Terphenyl (S)	74 %		50-150	1	06/28/11 15:10	07/02/11 09:06	84-15-1	

<b>Sample: EW-1-0611</b>		<b>Lab ID: 258246026</b>	Collected: 06/22/11 15:05		Received: 06/23/11 07:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.022 mg/L		0.019	1	06/28/11 15:10	07/02/11 09:22		
Motor Oil Range	ND mg/L		0.095	1	06/28/11 15:10	07/02/11 09:22	64742-65-0	
n-Octacosane (S)	80 %		50-150	1	06/28/11 15:10	07/02/11 09:22	630-02-4	
o-Terphenyl (S)	75 %		50-150	1	06/28/11 15:10	07/02/11 09:22	84-15-1	

<b>Sample: MW-3-0611</b>		<b>Lab ID: 258246027</b>	Collected: 06/22/11 16:00		Received: 06/23/11 07:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.066 mg/L		0.019	1	06/28/11 15:10	07/02/11 09:55		
Motor Oil Range	0.097 mg/L		0.095	1	06/28/11 15:10	07/02/11 09:55	64742-65-0	
n-Octacosane (S)	61 %		50-150	1	06/28/11 15:10	07/02/11 09:55	630-02-4	
o-Terphenyl (S)	58 %		50-150	1	06/28/11 15:10	07/02/11 09:55	84-15-1	

<b>Sample: MW-4-0611</b>		<b>Lab ID: 258246028</b>	Collected: 06/22/11 16:00		Received: 06/23/11 07:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.067 mg/L		0.019	1	06/28/11 15:10	07/02/11 10:11		
Motor Oil Range	0.11 mg/L		0.095	1	06/28/11 15:10	07/02/11 10:11	64742-65-0	
n-Octacosane (S)	78 %		50-150	1	06/28/11 15:10	07/02/11 10:11	630-02-4	
o-Terphenyl (S)	74 %		50-150	1	06/28/11 15:10	07/02/11 10:11	84-15-1	

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## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project: BNSF-Skykomish 6019113

Pace Project No.: 258246

QC Batch: OEXT/3946 Analysis Method: NWTPH-Dx  
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS  
Associated Lab Samples: 258246001, 258246002, 258246003, 258246004, 258246005, 258246007, 258246008, 258246010, 258246011, 258246012, 258246014, 258246015

METHOD BLANK: 75887 Matrix: Water

Associated Lab Samples: 258246001, 258246002, 258246003, 258246004, 258246005, 258246007, 258246008, 258246010, 258246011, 258246012, 258246014, 258246015

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	07/01/11 21:48	
Motor Oil Range	mg/L	ND	0.10	07/01/11 21:48	
n-Octacosane (S)	%	72	50-150	07/01/11 21:48	
o-Terphenyl (S)	%	62	50-150	07/01/11 21:48	

LABORATORY CONTROL SAMPLE: 75888

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	0.86	68	51-147	
Motor Oil Range	mg/L	1.2	1.1	84	20-160	
n-Octacosane (S)	%			85	50-150	
o-Terphenyl (S)	%			81	50-150	

SAMPLE DUPLICATE: 75889

Parameter	Units	258246001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND	.0099J		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	70	76	8	
o-Terphenyl (S)	%	64	71	11	

SAMPLE DUPLICATE: 75890

Parameter	Units	258246012 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.15	0.15	5	
Motor Oil Range	mg/L	ND	.068J		
n-Octacosane (S)	%	71	69	3	
o-Terphenyl (S)	%	68	66	3	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish 6019113

Pace Project No.: 258246

QC Batch:	OEXT/3950	Analysis Method:	NWTPH-Dx
QC Batch Method:	EPA 3510	Analysis Description:	NWTPH-Dx GCS
Associated Lab Samples:	258246016, 258246017, 258246018, 258246019, 258246020, 258246021, 258246022, 258246023, 258246024, 258246025, 258246026, 258246027, 258246028		

METHOD BLANK: 75981 Matrix: Water

Associated Lab Samples: 258246016, 258246017, 258246018, 258246019, 258246020, 258246021, 258246022, 258246023, 258246024, 258246025, 258246026, 258246027, 258246028

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	07/02/11 04:02	
Motor Oil Range	mg/L	ND	0.10	07/02/11 04:02	
n-Octacosane (S)	%	75	50-150	07/02/11 04:02	
o-Terphenyl (S)	%	69	50-150	07/02/11 04:02	

LABORATORY CONTROL SAMPLE: 75982

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	0.89	71	51-147	
Motor Oil Range	mg/L	1.2	1.1	84	20-160	
n-Octacosane (S)	%			84	50-150	
o-Terphenyl (S)	%			81	50-150	

SAMPLE DUPLICATE: 75983

Parameter	Units	258246018 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.20	0.17	12	
Motor Oil Range	mg/L	0.14	0.13	11	
n-Octacosane (S)	%	79	69	13	
o-Terphenyl (S)	%	78	69	12	

SAMPLE DUPLICATE: 75984

Parameter	Units	258246026 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.022	.013J		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	80	71	11	
o-Terphenyl (S)	%	75	63	17	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish 6019113

Pace Project No.: 258246

QC Batch: OEXT/3984

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 258246006, 258246009, 258246013

METHOD BLANK: 76880

Matrix: Water

Associated Lab Samples: 258246006, 258246009, 258246013

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	07/05/11 19:00	
Motor Oil Range	mg/L	ND	0.10	07/05/11 19:00	
n-Octacosane (S)	%	88	50-150	07/05/11 19:00	
o-Terphenyl (S)	%	79	50-150	07/05/11 19:00	

LABORATORY CONTROL SAMPLE: 76881

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	1.1	87	51-147	
Motor Oil Range	mg/L	1.2	1.1	91	20-160	
n-Octacosane (S)	%			88	50-150	
o-Terphenyl (S)	%			78	50-150	

SAMPLE DUPLICATE: 76882

Parameter	Units	258246013 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	88	90	1	
o-Terphenyl (S)	%	82	82	1	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish 6019113

Pace Project No.: 258246

QC Batch: OEXT/3943

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS SG

Associated Lab Samples: 258246013, 258246014, 258246015, 258246016, 258246017, 258246018, 258246019

METHOD BLANK: 75813

Matrix: Water

Associated Lab Samples: 258246013, 258246014, 258246015, 258246016, 258246017, 258246018, 258246019

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range SG	mg/L	ND	0.020	07/05/11 00:46	
Motor Oil Range SG	mg/L	ND	0.10	07/05/11 00:46	
n-Octacosane (S) SG	%	97	50-150	07/05/11 00:46	
o-Terphenyl (S) SG	%	90	50-150	07/05/11 00:46	

LABORATORY CONTROL SAMPLE: 75814

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range SG	mg/L	1.2	0.95	76	51-147	
Motor Oil Range SG	mg/L	1.2	1.1	90	20-160	
n-Octacosane (S) SG	%			82	50-150	
o-Terphenyl (S) SG	%			78	50-150	

SAMPLE DUPLICATE: 75815

Parameter	Units	258246018 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/L	0.031	0.036	14	
Motor Oil Range SG	mg/L	ND	ND		
n-Octacosane (S) SG	%	79	90	14	
o-Terphenyl (S) SG	%	77	88	14	

## QUALIFIERS

Project: BNSF-Skykomish 6019113

Pace Project No.: 258246

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-S Pace Analytical Services - Seattle



## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF-Skykomish 6019113

Pace Project No.: 258246

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
258246001	2B-W-4-0611	EPA 3510	OEXT/3946	NWTPH-Dx	GCSV/2654
258246002	GW-1-0611	EPA 3510	OEXT/3946	NWTPH-Dx	GCSV/2654
258246003	5-W-43-0611	EPA 3510	OEXT/3946	NWTPH-Dx	GCSV/2654
258246004	GW-2-0611	EPA 3510	OEXT/3946	NWTPH-Dx	GCSV/2654
258246005	GW-3-0611	EPA 3510	OEXT/3946	NWTPH-Dx	GCSV/2654
258246006	2A-W-41-0611	EPA 3510	OEXT/3984	NWTPH-Dx	GCSV/2670
258246007	2A-W-42-0611	EPA 3510	OEXT/3946	NWTPH-Dx	GCSV/2654
258246008	GW-4-0611	EPA 3510	OEXT/3946	NWTPH-Dx	GCSV/2654
258246009	EW-2A-0611	EPA 3510	OEXT/3984	NWTPH-Dx	GCSV/2670
258246010	IC-W-1-0611	EPA 3510	OEXT/3946	NWTPH-Dx	GCSV/2654
258246011	IC-W-7-0611	EPA 3510	OEXT/3946	NWTPH-Dx	GCSV/2654
258246012	IC-W-8-0611	EPA 3510	OEXT/3946	NWTPH-Dx	GCSV/2654
258246013	5-W-14-0611	EPA 3510	OEXT/3984	NWTPH-Dx	GCSV/2670
258246014	5-W-17-0611	EPA 3510	OEXT/3946	NWTPH-Dx	GCSV/2654
258246015	5-W-15-0611	EPA 3510	OEXT/3946	NWTPH-Dx	GCSV/2654
258246016	5-W-150-0611	EPA 3510	OEXT/3950	NWTPH-Dx	GCSV/2655
258246017	5-W-19-0611	EPA 3510	OEXT/3950	NWTPH-Dx	GCSV/2655
258246018	5-W-18-0611	EPA 3510	OEXT/3950	NWTPH-Dx	GCSV/2655
258246019	5-W-16-0611	EPA 3510	OEXT/3950	NWTPH-Dx	GCSV/2655
258246020	2A-W-9-0611	EPA 3510	OEXT/3950	NWTPH-Dx	GCSV/2655
258246021	2A-W-10-0611	EPA 3510	OEXT/3950	NWTPH-Dx	GCSV/2655
258246022	2A-W-100-0611	EPA 3510	OEXT/3950	NWTPH-Dx	GCSV/2655
258246023	1B-W-23	EPA 3510	OEXT/3950	NWTPH-Dx	GCSV/2655
258246024	2A-W-40-0611	EPA 3510	OEXT/3950	NWTPH-Dx	GCSV/2655
258246025	2A-W-400-0611	EPA 3510	OEXT/3950	NWTPH-Dx	GCSV/2655
258246026	EW-1-0611	EPA 3510	OEXT/3950	NWTPH-Dx	GCSV/2655
258246027	MW-3-0611	EPA 3510	OEXT/3950	NWTPH-Dx	GCSV/2655
258246028	MW-4-0611	EPA 3510	OEXT/3950	NWTPH-Dx	GCSV/2655
258246013	5-W-14-0611	EPA 3510	OEXT/3943	NWTPH-Dx	GCSV/2650
258246014	5-W-17-0611	EPA 3510	OEXT/3943	NWTPH-Dx	GCSV/2650
258246015	5-W-15-0611	EPA 3510	OEXT/3943	NWTPH-Dx	GCSV/2650
258246016	5-W-150-0611	EPA 3510	OEXT/3943	NWTPH-Dx	GCSV/2650
258246017	5-W-19-0611	EPA 3510	OEXT/3943	NWTPH-Dx	GCSV/2650
258246018	5-W-18-0611	EPA 3510	OEXT/3943	NWTPH-Dx	GCSV/2650
258246019	5-W-16-0611	EPA 3510	OEXT/3943	NWTPH-Dx	GCSV/2650

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

258246

## Section A

Required Client Information:

Company: BNSF

Address:

Email To:

Phone: Fax:

Requested Due Date/TAT: std

## Section B

Required Project Information:

Report To: Jennifer Wald

Copy To: Renee Knecht

Purchase Order No.: ITD100-K40

Project Name: BNSF-Skykomish

Project Number: 60191113

## Section C

Invoice Information:

Attention: Bruce Sheppard

Company Name: BNSF

Address:

Pace Quote Reference:

Pace Project Manager:

Pace Profile #:

Page: 1 of 3

**1470741**

## REGULATORY AGENCY

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER  
☐ UST ☐ RCRA ☐ OTHER

Site Location

STATE: WA

## Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analysis Test ↓	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
					COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol				Other																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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ORIGINAL

## SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Dean W. Kinnear

SIGNATURE of SAMPLER: [Signature]

DATE Signed (MM/DD/YY): 6/23/11

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)



\*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.







# Sample Container Count

258246

CLIENT:

BNSF



COC PAGE

1 of 3

COC ID#

1470741

Sample Line

Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU					Comments
1		22														
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																Trip Blank?

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFU	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		



# Sample Container Count

2 5 8 2 4 6

CLIENT:

BNSF

COC PAGE

2 of 3

COC ID#

1470742



Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU					Comments
1		20														
2		↓														
3																
4																
5		↓														
6		10														
7		20														
8		↓														
9																
10																
11																
12		↓														Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFU	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		

# Sample Container Count

258246

CLIENT:

BNSF



COC PAGE

3 of 3

COC ID#

1338906

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU					Comments
1		202														
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFU	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		





# Sample Condition Upon Receipt

Client Name: BNSF

Project #

258246

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace Other \_\_\_\_\_

Tracking #: \_\_\_\_\_

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No Seals intact: ☐ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other \_\_\_\_\_ Temp. Blank ☒ Yes ☐ No

Thermometer Used 132013 or 101731962 or 226099 Type of Ice: ☒ Wet ☐ Blue ☐ None ☒ Samples on ice, cooling process has begun

Cooler Temperature 0.2, 3.7, 5.7, 2.7, 3.6, 5.4, 4.4, 2.9°C Biological Tissue is Frozen: Yes ☐ No ☒ Date and Initials of person examining contents: NJS 6/23/11

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Follow Up / Hold Analysis Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	8.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
-Includes date/time/ID/Analysis Matrix: <u>Water</u>		
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G		Initial when completed
		Lot # of added preservative
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blanks Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	17.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review:

ARB

Date: 6/24/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

August 11, 2011

Mark Havighorst  
AECOM - BNSF  
333 SW 5th Avenue, Suite 225  
Portland, OR 97204

RE: Project: Skykomish Compliance Monitorin  
Pace Project No.: 258667

Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on July 28, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,



Andy Brownfield

andy.brownfield@pacelabs.com  
Project Manager

Enclosures

cc: Sarah Albano, AECOM (BNSF)  
Cynthia Jennings, BNSF\_AECOM-WA  
Eric Storkerson, AECOM (BNSF)  
Jennifer Wald, AECOM (BNSF)



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, Inc..

## CERTIFICATIONS

Project: Skykomish Compliance Monitorin

Pace Project No.: 258667

### Washington Certification IDs

940 South Harney Street, Seattle, WA 98108

Alaska CS Certification #: UST-025

California Certification #: 01153CA

Florida/NELAP Certification #: E87617

Oregon Certification #: WA200007

Washington Certification #: C555

---

## REPORT OF LABORATORY ANALYSIS



## SAMPLE ANALYTE COUNT

Project: Skykomish Compliance Monitorin

Pace Project No.: 258667

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
258667001	IC-W-1-0711	NWTPH-Dx	DMT	4	PASI-S
258667002	IC-W-7-0711	NWTPH-Dx	DMT	4	PASI-S
258667003	IC-W-8-0711	NWTPH-Dx	DMT	4	PASI-S
258667004	IC-W-80-0711	NWTPH-Dx	DMT	4	PASI-S

## REPORT OF LABORATORY ANALYSIS

## PROJECT NARRATIVE

Project: Skykomish Compliance Monitorin

Pace Project No.: 258667

---

**Method:** NWTPH-Dx

**Description:** NWTPH-Dx GCS

**Client:** BNSF\_AECOM-WA

**Date:** August 11, 2011

**General Information:**

4 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3510 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

## ANALYTICAL RESULTS

Project: Skykomish Compliance Monitorin

Pace Project No.: 258667

<b>Sample: IC-W-1-0711</b>		<b>Lab ID: 258667001</b>	Collected: 07/28/11 13:40	Received: 07/28/11 17:48	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND mg/L		0.078	1	08/01/11 15:50	08/02/11 13:09		
Motor Oil Range	ND mg/L		0.39	1	08/01/11 15:50	08/02/11 13:09	64742-65-0	
n-Octacosane (S)	90 %		50-150	1	08/01/11 15:50	08/02/11 13:09	630-02-4	
o-Terphenyl (S)	88 %		50-150	1	08/01/11 15:50	08/02/11 13:09	84-15-1	

<b>Sample: IC-W-7-0711</b>		<b>Lab ID: 258667002</b>	Collected: 07/28/11 11:35	Received: 07/28/11 17:48	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND mg/L		0.076	1	08/01/11 15:50	08/02/11 13:25		
Motor Oil Range	ND mg/L		0.38	1	08/01/11 15:50	08/02/11 13:25	64742-65-0	
n-Octacosane (S)	99 %		50-150	1	08/01/11 15:50	08/02/11 13:25	630-02-4	
o-Terphenyl (S)	96 %		50-150	1	08/01/11 15:50	08/02/11 13:25	84-15-1	

<b>Sample: IC-W-8-0711</b>		<b>Lab ID: 258667003</b>	Collected: 07/28/11 12:40	Received: 07/28/11 17:48	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.14</b> mg/L		0.076	1	08/01/11 15:50	08/02/11 13:42		
Motor Oil Range	ND mg/L		0.38	1	08/01/11 15:50	08/02/11 13:42	64742-65-0	
n-Octacosane (S)	92 %		50-150	1	08/01/11 15:50	08/02/11 13:42	630-02-4	
o-Terphenyl (S)	90 %		50-150	1	08/01/11 15:50	08/02/11 13:42	84-15-1	

<b>Sample: IC-W-80-0711</b>		<b>Lab ID: 258667004</b>	Collected: 07/28/11 13:00	Received: 07/28/11 17:48	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.16</b> mg/L		0.076	1	08/01/11 15:50	08/02/11 13:58		
Motor Oil Range	ND mg/L		0.38	1	08/01/11 15:50	08/02/11 13:58	64742-65-0	
n-Octacosane (S)	98 %		50-150	1	08/01/11 15:50	08/02/11 13:58	630-02-4	
o-Terphenyl (S)	96 %		50-150	1	08/01/11 15:50	08/02/11 13:58	84-15-1	

## QUALITY CONTROL DATA

Project: Skykomish Compliance Monitorin

Pace Project No.: 258667

QC Batch: OEXT/4147

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 258667001, 258667002, 258667003, 258667004

METHOD BLANK: 80196

Matrix: Water

Associated Lab Samples: 258667001, 258667002, 258667003, 258667004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.080	08/02/11 08:45	
Motor Oil Range	mg/L	ND	0.40	08/02/11 08:45	
n-Octacosane (S)	%	97	50-150	08/02/11 08:45	
o-Terphenyl (S)	%	94	50-150	08/02/11 08:45	

LABORATORY CONTROL SAMPLE: 80197

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	5	4.6	92	51-147	
Motor Oil Range	mg/L	5	5.0	101	20-160	
n-Octacosane (S)	%			96	50-150	
o-Terphenyl (S)	%			90	50-150	

SAMPLE DUPLICATE: 80198

Parameter	Units	258673007 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	1.1	1.1	4	
Motor Oil Range	mg/L	0.49	0.68	33	
n-Octacosane (S)	%	92	90	2	
o-Terphenyl (S)	%	91	89	2	

SAMPLE DUPLICATE: 80199

Parameter	Units	258667004 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.16	0.15	5	
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	98	93	5	
o-Terphenyl (S)	%	96	91	5	

## QUALIFIERS

Project: Skykomish Compliance Monitorin

Pace Project No.: 258667

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-S Pace Analytical Services - Seattle



## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Skykomish Compliance Monitorin

Pace Project No.: 258667

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
258667001	IC-W-1-0711	EPA 3510	OEXT/4147	NWTPH-Dx	GCSV/2766
258667002	IC-W-7-0711	EPA 3510	OEXT/4147	NWTPH-Dx	GCSV/2766
258667003	IC-W-8-0711	EPA 3510	OEXT/4147	NWTPH-Dx	GCSV/2766
258667004	IC-W-80-0711	EPA 3510	OEXT/4147	NWTPH-Dx	GCSV/2766

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

## Section A

Required Client Information:

Company: **AECOM**  
Address: **710 2nd Ave.,  
Suite 1000, Seattle WA 98104**  
Email To: **Mark.Havighost@aecom.com**  
Phone: **206-624-9347** Fax: **206-623-3773**  
Requested Due Date/TAT:

## Section B

Required Project Information:

Report To: **Mark Havighost**  
Copy To: **Rene Kretsch**  
Purchase Order No.:  
Project Name: **BNSF SKYKOMISH**  
Project Number: **6019113 - 0540**

## Section C

Invoice Information:

Attention:  
Company Name:  
Address:  
Pace Quote Reference:  
Pace Project Manager:  
Pace Profile #:

Page:

of

**1470960**

## REGULATORY AGENCY

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER  
☐ UST ☐ RCRA ☐ OTHER

Site Location: **SKYKOMISH**  
STATE: **WA**

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	Matrix Codes MATRIX / CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test ↓	Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
						COMPOSITE START		COMPOSITE END/GRAB				Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other		Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N			Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Abdelghani Sibbani	07/28/11	1748	Jyothi Sanyal/PACE	07/28/11	1748	14	Y	N	Y

ORIGINAL

## SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Abdelghani Sibbani

SIGNATURE of SAMPLER: Abdelghani Sibbani

DATE Signed (MM/DD/YY): 07/28/11



# Sample Container Count

CLIENT: AECOM

COC PAGE 1 of 1  
COC ID# 1470960



Sample Line  
Item

VG9H AG1H AG1U BG1H BP1U BP2U BP3U BP2N BP2S WGFU WGPU

Comments

1		20																	
2		20																	
3		20																	
4		20																	
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
																		Trip Blank?	No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFV	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		



# Sample Condition Upon Receipt

Client Name: AECOM

Project # \_\_\_\_\_

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace Other \_\_\_\_\_

Tracking #: \_\_\_\_\_

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No Seals intact: ☐ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other \_\_\_\_\_ Temp. Blank ☒ Yes ☐ No

Thermometer Used 132013 of 101731952 or 226099 Type of Ice: ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temperature 1.4°C Biological Tissue is Frozen: Yes No

Temp should be above freezing  $\leq 6^{\circ}\text{C}$

Comments:

Date and Initials of person examining contents: NJS 072811

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Follow Up / Hold Analysis Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	8.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
-Includes date/time/ID/Analysis Matrix: <u>water</u>		
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G		Initial when completed
		Lot # of added preservative
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Headspace in VOA Vials (>5mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blanks Present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	17.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Project Manager Review: \_\_\_\_\_

ARB

Date: 7/29/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

September 07, 2011

Mark Havighorst  
AECOM - BNSF  
333 SW 5th Avenue, Suite 225  
Portland, OR 97204

RE: Project: Skykomish  
Pace Project No.: 259039

Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on August 30, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,



Andy Brownfield

andy.brownfield@pacelabs.com  
Project Manager

Enclosures

cc: Renee Knecht, AECOM (BNSF)  
Jennifer Wald, AECOM (BNSF)



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Skykomish

Pace Project No.: 259039

### Washington Certification IDs

940 South Harney Street, Seattle, WA 98108

Alaska CS Certification #: UST-025

California Certification #: 01153CA

Florida/NELAP Certification #: E87617

Oregon Certification #: WA200007

Washington Certification #: C555

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## REPORT OF LABORATORY ANALYSIS

Page 2 of 7

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## PROJECT NARRATIVE

Project: Skykomish

Pace Project No.: 259039

---

**Method:** NWTPH-Dx

**Description:** NWTPH-Dx GCS

**Client:** BNSF\_AECOM-WA

**Date:** September 07, 2011

**General Information:**

4 samples were analyzed for NWTPH-Dx. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3510 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Surrogates:**

All surrogates were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

## ANALYTICAL RESULTS

Project: Skykomish

Pace Project No.: 259039

<b>Sample: IC-W-1-0811</b>		<b>Lab ID: 259039001</b>	Collected: 08/30/11 12:45	Received: 08/30/11 17:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.023</b>	mg/L	0.019	1	09/02/11 13:10	09/03/11 01:46		
Motor Oil Range	ND	mg/L	0.095	1	09/02/11 13:10	09/03/11 01:46	64742-65-0	
n-Octacosane (S)	74	%	50-150	1	09/02/11 13:10	09/03/11 01:46	630-02-4	
o-Terphenyl (S)	68	%	50-150	1	09/02/11 13:10	09/03/11 01:46	84-15-1	

<b>Sample: IC-W-7-0811</b>		<b>Lab ID: 259039002</b>	Collected: 08/30/11 14:25	Received: 08/30/11 17:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.030</b>	mg/L	0.019	1	09/02/11 13:10	09/03/11 02:54		
Motor Oil Range	ND	mg/L	0.095	1	09/02/11 13:10	09/03/11 02:54	64742-65-0	
n-Octacosane (S)	60	%	50-150	1	09/02/11 13:10	09/03/11 02:54	630-02-4	
o-Terphenyl (S)	51	%	50-150	1	09/02/11 13:10	09/03/11 02:54	84-15-1	

<b>Sample: IC-W-80-0811</b>		<b>Lab ID: 259039003</b>	Collected: 08/30/11 14:00	Received: 08/30/11 17:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.12</b>	mg/L	0.019	1	09/02/11 13:10	09/03/11 03:11		
Motor Oil Range	ND	mg/L	0.095	1	09/02/11 13:10	09/03/11 03:11	64742-65-0	
n-Octacosane (S)	71	%	50-150	1	09/02/11 13:10	09/03/11 03:11	630-02-4	
o-Terphenyl (S)	64	%	50-150	1	09/02/11 13:10	09/03/11 03:11	84-15-1	

<b>Sample: IC-W-8-0811</b>		<b>Lab ID: 259039004</b>	Collected: 08/30/11 13:25	Received: 08/30/11 17:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	<b>0.14</b>	mg/L	0.019	1	09/02/11 13:10	09/03/11 03:27		
Motor Oil Range	ND	mg/L	0.095	1	09/02/11 13:10	09/03/11 03:27	64742-65-0	
n-Octacosane (S)	77	%	50-150	1	09/02/11 13:10	09/03/11 03:27	630-02-4	
o-Terphenyl (S)	70	%	50-150	1	09/02/11 13:10	09/03/11 03:27	84-15-1	

## QUALITY CONTROL DATA

Project: Skykomish

Pace Project No.: 259039

QC Batch: OEXT/4321

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 259039001, 259039002, 259039003, 259039004

METHOD BLANK: 84546

Matrix: Water

Associated Lab Samples: 259039001, 259039002, 259039003, 259039004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	09/03/11 01:13	
Motor Oil Range	mg/L	ND	0.10	09/03/11 01:13	
n-Octacosane (S)	%	88	50-150	09/03/11 01:13	
o-Terphenyl (S)	%	83	50-150	09/03/11 01:13	

LABORATORY CONTROL SAMPLE: 84547

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1.2	0.89	72	51-147	
Motor Oil Range	mg/L	1.2	1.0	83	20-160	
n-Octacosane (S)	%			84	50-150	
o-Terphenyl (S)	%			76	50-150	

SAMPLE DUPLICATE: 84548

Parameter	Units	259039001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.023	0.033	34	
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	74	80	9	
o-Terphenyl (S)	%	68	75	9	

## QUALIFIERS

Project: Skykomish

Pace Project No.: 259039

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-S Pace Analytical Services - Seattle



## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Skykomish

Pace Project No.: 259039

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
259039001	IC-W-1-0811	EPA 3510	OEXT/4321	NWTPH-Dx	GCSV/2870
259039002	IC-W-7-0811	EPA 3510	OEXT/4321	NWTPH-Dx	GCSV/2870
259039003	IC-W-80-0811	EPA 3510	OEXT/4321	NWTPH-Dx	GCSV/2870
259039004	IC-W-8-0811	EPA 3510	OEXT/4321	NWTPH-Dx	GCSV/2870





# Sample Container Count

2 5 9 0 3 9

CLIENT:

AECOM



COC PAGE

1 of 1

COC ID#

1338246

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU					Comments
1		2 <sup>42</sup>														
2		↓														
3		↓														
4		↓														
5																
6																
7																
8																
9																
10																
11																
12																Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFU	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		



# Sample Condition Upon Receipt

259039

Client Name: AECOM

Project # \_\_\_\_\_

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace Other \_\_\_\_\_

Tracking #: \_\_\_\_\_

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No Seals intact: ☐ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other \_\_\_\_\_ Temp. Blank Yes ☒ No

Thermometer Used 132013 or 101731962 or 226099 Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 0.92  
Temp should be above freezing  $\leq 6^{\circ}\text{C}$

Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: 08/31/11 CW

Comments:

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Follow Up / Hold Analysis Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	8.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
-Includes date/time/ID/Analysis Matrix:	<u>WT</u>	
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G		
	Initial when completed	Lot # of added preservative
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blanks Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	17.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Creation Date:		

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: CRB

Date: 8/31/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

October 06, 2011

Mark Havighorst  
AECOM - BNSF  
333 SW 5th Avenue, Suite 225  
Portland, OR 97204

RE: Project: BNSF-Skykomish  
Pace Project No.: 259304

Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on September 21, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards, where applicable, unless otherwise narrated in the body of the report.

The samples were received outside of required temperature range, for two coolers. Analysis was completed upon client approval.

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

Sincerely,



Andy Brownfield

andy.brownfield@pacelabs.com  
Project Manager

Enclosures

cc: Renee Knecht, AECOM (BNSF)  
Jennifer Wald, AECOM (BNSF)



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: BNSF-Skykomish

Pace Project No.: 259304

### Washington Certification IDs

940 South Harney Street, Seattle, WA 98108

Alaska CS Certification #: UST-025

Arizona Certification #: AZ0770

California Certification #: 01153CA

Florida/NELAP Certification #: E87617

Oregon Certification #: WA200007

Washington Certification #: C555

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE ANALYTE COUNT

Project: BNSF-Skykomish

Pace Project No.: 259304

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
259304001	MW-4-0911	NWTPH-Dx	AY1	4	PASI-S
259304002	MW-400-0911	NWTPH-Dx	AY1	4	PASI-S
259304003	ZA-W-10-0911	NWTPH-Dx	AY1	4	PASI-S
259304004	ZA-W-9-0911	NWTPH-Dx	AY1	4	PASI-S
259304005	ZB-W-4-0911	NWTPH-Dx	AY1	4	PASI-S
259304006	MW-3-0911	NWTPH-Dx	AY1	4	PASI-S
259304007	S-W-43-0911	NWTPH-Dx	AY1	4	PASI-S
259304008	GW-1-0911	NWTPH-Dx	AY1	4	PASI-S
259304009	IC-W-1-0911	NWTPH-Dx	AY1	4	PASI-S
259304010	IC-W-8-0911	NWTPH-Dx	AY1	4	PASI-S
259304011	IC-W-3-0911	NWTPH-Dx	AY1	4	PASI-S
259304012	IC-W-4-0911	NWTPH-Dx	AY1	4	PASI-S
259304013	IC-W-7-0911	NWTPH-Dx	AY1	4	PASI-S
259304014	IB-W-2-0911	NWTPH-Dx	AY1	4	PASI-S
259304015	IB-W-3-0911	NWTPH-Dx	AY1	4	PASI-S
259304016	MW-38R-0911	NWTPH-Dx	AY1	4	PASI-S
259304017	EW-1-0911	NWTPH-Dx	AY1	4	PASI-S
259304018	ZA-W-41-0911	NWTPH-Dx	AY1	4	PASI-S
259304019	ZA-W-40-0911	NWTPH-Dx	AY1	4	PASI-S
259304020	ZA-W-400-0911	NWTPH-Dx	AY1	4	PASI-S
259304021	GW-3-0911	NWTPH-Dx	AY1	4	PASI-S
259304022	GW-30-0911	NWTPH-Dx	AY1	4	PASI-S
259304023	ZA-W-42-0911	NWTPH-Dx	AY1	4	PASI-S
259304024	GW-4-0911	NWTPH-Dx	AY1	4	PASI-S

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259304

<b>Sample: MW-4-0911</b>		<b>Lab ID: 259304001</b>	Collected: 09/19/11 10:05		Received: 09/21/11 08:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.025	mg/L	0.019	1	09/28/11 09:35	09/28/11 15:36		
Motor Oil Range	ND	mg/L	0.095	1	09/28/11 09:35	09/28/11 15:36	64742-65-0	
n-Octacosane (S)	62	%	50-150	1	09/28/11 09:35	09/28/11 15:36	630-02-4	
o-Terphenyl (S)	63	%	50-150	1	09/28/11 09:35	09/28/11 15:36	84-15-1	

<b>Sample: MW-400-0911</b>		<b>Lab ID: 259304002</b>	Collected: 09/19/11 10:20		Received: 09/21/11 08:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.025	mg/L	0.019	1	09/28/11 09:35	09/28/11 16:09		
Motor Oil Range	ND	mg/L	0.095	1	09/28/11 09:35	09/28/11 16:09	64742-65-0	
n-Octacosane (S)	68	%	50-150	1	09/28/11 09:35	09/28/11 16:09	630-02-4	
o-Terphenyl (S)	65	%	50-150	1	09/28/11 09:35	09/28/11 16:09	84-15-1	

<b>Sample: ZA-W-10-0911</b>		<b>Lab ID: 259304003</b>	Collected: 09/19/11 10:45		Received: 09/21/11 08:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.19	mg/L	0.019	1	09/28/11 09:35	09/28/11 16:26		
Motor Oil Range	0.39	mg/L	0.095	1	09/28/11 09:35	09/28/11 16:26	64742-65-0	
n-Octacosane (S)	72	%	50-150	1	09/28/11 09:35	09/28/11 16:26	630-02-4	
o-Terphenyl (S)	72	%	50-150	1	09/28/11 09:35	09/28/11 16:26	84-15-1	

<b>Sample: ZA-W-9-0911</b>		<b>Lab ID: 259304004</b>	Collected: 09/19/11 11:15		Received: 09/21/11 08:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.66	mg/L	0.019	1	09/28/11 09:35	09/28/11 16:43		
Motor Oil Range	0.44	mg/L	0.095	1	09/28/11 09:35	09/28/11 16:43	64742-65-0	
n-Octacosane (S)	63	%	50-150	1	09/28/11 09:35	09/28/11 16:43	630-02-4	
o-Terphenyl (S)	64	%	50-150	1	09/28/11 09:35	09/28/11 16:43	84-15-1	

<b>Sample: ZB-W-4-0911</b>		<b>Lab ID: 259304005</b>	Collected: 09/19/11 13:10		Received: 09/21/11 08:45		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.019	1	09/28/11 09:35	09/28/11 16:59		
Motor Oil Range	ND	mg/L	0.095	1	09/28/11 09:35	09/28/11 16:59	64742-65-0	

Date: 10/06/2011 11:51 AM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259304

<b>Sample: ZB-W-4-0911</b>	<b>Lab ID: 259304005</b>	Collected: 09/19/11 13:10	Received: 09/21/11 08:45	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

n-Octacosane (S)	68 %		50-150	1	09/28/11 09:35	09/28/11 16:59	630-02-4	
o-Terphenyl (S)	65 %		50-150	1	09/28/11 09:35	09/28/11 16:59	84-15-1	

<b>Sample: MW-3-0911</b>	<b>Lab ID: 259304006</b>	Collected: 09/19/11 13:55	Received: 09/21/11 08:45	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.067 mg/L		0.019	1	09/28/11 09:35	09/28/11 17:49		
Motor Oil Range	0.11 mg/L		0.095	1	09/28/11 09:35	09/28/11 17:49	64742-65-0	
n-Octacosane (S)	79 %		50-150	1	09/28/11 09:35	09/28/11 17:49	630-02-4	
o-Terphenyl (S)	77 %		50-150	1	09/28/11 09:35	09/28/11 17:49	84-15-1	

<b>Sample: S-W-43-0911</b>	<b>Lab ID: 259304007</b>	Collected: 09/19/11 14:50	Received: 09/21/11 08:45	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	ND mg/L		0.019	1	09/28/11 09:35	09/28/11 18:06		
Motor Oil Range	ND mg/L		0.095	1	09/28/11 09:35	09/28/11 18:06	64742-65-0	
n-Octacosane (S)	63 %		50-150	1	09/28/11 09:35	09/28/11 18:06	630-02-4	
o-Terphenyl (S)	60 %		50-150	1	09/28/11 09:35	09/28/11 18:06	84-15-1	

<b>Sample: GW-1-0911</b>	<b>Lab ID: 259304008</b>	Collected: 09/19/11 15:45	Received: 09/21/11 08:45	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.084 mg/L		0.019	1	09/28/11 09:35	09/28/11 18:23		
Motor Oil Range	ND mg/L		0.095	1	09/28/11 09:35	09/28/11 18:23	64742-65-0	
n-Octacosane (S)	76 %		50-150	1	09/28/11 09:35	09/28/11 18:23	630-02-4	
o-Terphenyl (S)	75 %		50-150	1	09/28/11 09:35	09/28/11 18:23	84-15-1	

<b>Sample: IC-W-1-0911</b>	<b>Lab ID: 259304009</b>	Collected: 09/20/11 10:20	Received: 09/21/11 08:45	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.038 mg/L		0.019	1	09/28/11 09:35	09/28/11 18:56		
Motor Oil Range	ND mg/L		0.095	1	09/28/11 09:35	09/28/11 18:56	64742-65-0	
n-Octacosane (S)	75 %		50-150	1	09/28/11 09:35	09/28/11 18:56	630-02-4	
o-Terphenyl (S)	72 %		50-150	1	09/28/11 09:35	09/28/11 18:56	84-15-1	

Date: 10/06/2011 11:51 AM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259304

<b>Sample: IC-W-8-0911</b>		<b>Lab ID: 259304010</b>	Collected: 09/20/11 11:10	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.15 mg/L		0.019	1	09/28/11 09:35	09/28/11 19:13		
Motor Oil Range	ND mg/L		0.095	1	09/28/11 09:35	09/28/11 19:13	64742-65-0	
n-Octacosane (S)	80 %		50-150	1	09/28/11 09:35	09/28/11 19:13	630-02-4	
o-Terphenyl (S)	79 %		50-150	1	09/28/11 09:35	09/28/11 19:13	84-15-1	

<b>Sample: IC-W-3-0911</b>		<b>Lab ID: 259304011</b>	Collected: 09/20/11 12:00	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.033 mg/L		0.019	1	09/28/11 09:35	09/28/11 19:30		
Motor Oil Range	ND mg/L		0.095	1	09/28/11 09:35	09/28/11 19:30	64742-65-0	
n-Octacosane (S)	71 %		50-150	1	09/28/11 09:35	09/28/11 19:30	630-02-4	
o-Terphenyl (S)	70 %		50-150	1	09/28/11 09:35	09/28/11 19:30	84-15-1	

<b>Sample: IC-W-4-0911</b>		<b>Lab ID: 259304012</b>	Collected: 09/20/11 14:40	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.051 mg/L		0.019	1	09/28/11 09:35	09/28/11 19:46		
Motor Oil Range	ND mg/L		0.095	1	09/28/11 09:35	09/28/11 19:46	64742-65-0	
n-Octacosane (S)	71 %		50-150	1	09/28/11 09:35	09/28/11 19:46	630-02-4	
o-Terphenyl (S)	68 %		50-150	1	09/28/11 09:35	09/28/11 19:46	84-15-1	

<b>Sample: IC-W-7-0911</b>		<b>Lab ID: 259304013</b>	Collected: 09/20/11 15:35	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.039 mg/L		0.019	1	09/28/11 09:35	09/28/11 20:03		
Motor Oil Range	ND mg/L		0.095	1	09/28/11 09:35	09/28/11 20:03	64742-65-0	
n-Octacosane (S)	69 %		50-150	1	09/28/11 09:35	09/28/11 20:03	630-02-4	
o-Terphenyl (S)	65 %		50-150	1	09/28/11 09:35	09/28/11 20:03	84-15-1	

<b>Sample: IB-W-2-0911</b>		<b>Lab ID: 259304014</b>	Collected: 09/20/11 16:35	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.12 mg/L		0.019	1	09/28/11 09:35	09/28/11 20:53		
Motor Oil Range	ND mg/L		0.095	1	09/28/11 09:35	09/28/11 20:53	64742-65-0	

Date: 10/06/2011 11:51 AM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259304

<b>Sample: IB-W-2-0911</b>	<b>Lab ID: 259304014</b>	Collected: 09/20/11 16:35	Received: 09/21/11 08:45	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

n-Octacosane (S)	76 %		50-150	1	09/28/11 09:35	09/28/11 20:53	630-02-4	
o-Terphenyl (S)	77 %		50-150	1	09/28/11 09:35	09/28/11 20:53	84-15-1	

<b>Sample: IB-W-3-0911</b>	<b>Lab ID: 259304015</b>	Collected: 09/20/11 17:50	Received: 09/21/11 08:45	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.038 mg/L		0.019	1	09/28/11 09:35	09/28/11 21:10		
Motor Oil Range	ND mg/L		0.095	1	09/28/11 09:35	09/28/11 21:10	64742-65-0	
n-Octacosane (S)	69 %		50-150	1	09/28/11 09:35	09/28/11 21:10	630-02-4	
o-Terphenyl (S)	65 %		50-150	1	09/28/11 09:35	09/28/11 21:10	84-15-1	

<b>Sample: MW-38R-0911</b>	<b>Lab ID: 259304016</b>	Collected: 09/20/11 10:20	Received: 09/21/11 08:45	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.063 mg/L		0.020	1	09/28/11 09:35	09/28/11 21:27		
Motor Oil Range	ND mg/L		0.099	1	09/28/11 09:35	09/28/11 21:27	64742-65-0	
n-Octacosane (S)	65 %		50-150	1	09/28/11 09:35	09/28/11 21:27	630-02-4	
o-Terphenyl (S)	63 %		50-150	1	09/28/11 09:35	09/28/11 21:27	84-15-1	

<b>Sample: EW-1-0911</b>	<b>Lab ID: 259304017</b>	Collected: 09/20/11 11:10	Received: 09/21/11 08:45	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.024 mg/L		0.020	1	09/28/11 13:35	09/29/11 15:04		B+,P2
Motor Oil Range	ND mg/L		0.098	1	09/28/11 13:35	09/29/11 15:04	64742-65-0	
n-Octacosane (S)	64 %		50-150	1	09/28/11 13:35	09/29/11 15:04	630-02-4	
o-Terphenyl (S)	64 %		50-150	1	09/28/11 13:35	09/29/11 15:04	84-15-1	

<b>Sample: ZA-W-41-0911</b>	<b>Lab ID: 259304018</b>	Collected: 09/20/11 12:10	Received: 09/21/11 08:45	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.023 mg/L		0.020	1	10/04/11 06:05	10/04/11 13:36		
Motor Oil Range	ND mg/L		0.10	1	10/04/11 06:05	10/04/11 13:36	64742-65-0	
n-Octacosane (S)	60 %		50-150	1	10/04/11 06:05	10/04/11 13:36	630-02-4	
o-Terphenyl (S)	59 %		50-150	1	10/04/11 06:05	10/04/11 13:36	84-15-1	

Date: 10/06/2011 11:51 AM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259304

Sample: ZA-W-40-0911		Lab ID: 259304019		Collected: 09/20/11 14:30		Received: 09/21/11 08:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.020	1	10/04/11 06:05	10/04/11 13:52		
Motor Oil Range		ND mg/L		0.099	1	10/04/11 06:05	10/04/11 13:52	64742-65-0	
n-Octacosane (S)		75 %		50-150	1	10/04/11 06:05	10/04/11 13:52	630-02-4	
o-Terphenyl (S)		74 %		50-150	1	10/04/11 06:05	10/04/11 13:52	84-15-1	

Sample: ZA-W-400-0911		Lab ID: 259304020		Collected: 09/20/11 13:30		Received: 09/21/11 08:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.020	1	09/28/11 13:35	09/29/11 16:11		B-
Motor Oil Range		ND mg/L		0.098	1	09/28/11 13:35	09/29/11 16:11	64742-65-0	
n-Octacosane (S)		77 %		50-150	1	09/28/11 13:35	09/29/11 16:11	630-02-4	
o-Terphenyl (S)		74 %		50-150	1	09/28/11 13:35	09/29/11 16:11	84-15-1	

Sample: GW-3-0911		Lab ID: 259304021		Collected: 09/20/11 15:40		Received: 09/21/11 08:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.022 mg/L		0.020	1	10/04/11 06:05	10/04/11 14:09		
Motor Oil Range		ND mg/L		0.10	1	10/04/11 06:05	10/04/11 14:09	64742-65-0	
n-Octacosane (S)		70 %		50-150	1	10/04/11 06:05	10/04/11 14:09	630-02-4	
o-Terphenyl (S)		71 %		50-150	1	10/04/11 06:05	10/04/11 14:09	84-15-1	

Sample: GW-30-0911		Lab ID: 259304022		Collected: 09/20/11 14:40		Received: 09/21/11 08:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.020	1	10/04/11 06:05	10/04/11 14:26		
Motor Oil Range		ND mg/L		0.10	1	10/04/11 06:05	10/04/11 14:26	64742-65-0	
n-Octacosane (S)		70 %		50-150	1	10/04/11 06:05	10/04/11 14:26	630-02-4	
o-Terphenyl (S)		70 %		50-150	1	10/04/11 06:05	10/04/11 14:26	84-15-1	

Sample: ZA-W-42-0911		Lab ID: 259304023		Collected: 09/20/11 16:40		Received: 09/21/11 08:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.084 mg/L		0.020	1	10/04/11 06:05	10/04/11 14:43		
Motor Oil Range		ND mg/L		0.10	1	10/04/11 06:05	10/04/11 14:43	64742-65-0	

Date: 10/06/2011 11:51 AM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259304

<b>Sample: ZA-W-42-0911</b>		<b>Lab ID: 259304023</b>	Collected: 09/20/11 16:40	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
n-Octacosane (S)	70 %		50-150	1	10/04/11 06:05	10/04/11 14:43	630-02-4	
o-Terphenyl (S)	71 %		50-150	1	10/04/11 06:05	10/04/11 14:43	84-15-1	

<b>Sample: GW-4-0911</b>		<b>Lab ID: 259304024</b>	Collected: 09/20/11 17:30	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND mg/L		0.020	1	10/04/11 06:05	10/04/11 14:59		
Motor Oil Range	ND mg/L		0.10	1	10/04/11 06:05	10/04/11 14:59	64742-65-0	
n-Octacosane (S)	63 %		50-150	1	10/04/11 06:05	10/04/11 14:59	630-02-4	
o-Terphenyl (S)	60 %		50-150	1	10/04/11 06:05	10/04/11 14:59	84-15-1	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 259304

QC Batch:	OEXT/4425	Analysis Method:	NWTPH-Dx
QC Batch Method:	EPA 3510	Analysis Description:	NWTPH-Dx GCS
Associated Lab Samples:	259304001, 259304002, 259304003, 259304004, 259304005, 259304006, 259304007, 259304008, 259304009, 259304010, 259304011, 259304012, 259304013, 259304014, 259304015, 259304016		

METHOD BLANK: 87628 Matrix: Water

Associated Lab Samples: 259304001, 259304002, 259304003, 259304004, 259304005, 259304006, 259304007, 259304008, 259304009, 259304010, 259304011, 259304012, 259304013, 259304014, 259304015, 259304016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	09/28/11 15:03	
Motor Oil Range	mg/L	ND	0.10	09/28/11 15:03	
n-Octacosane (S)	%	78	50-150	09/28/11 15:03	
o-Terphenyl (S)	%	78	50-150	09/28/11 15:03	

LABORATORY CONTROL SAMPLE: 87629

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1	0.80	80	51-147	
Motor Oil Range	mg/L	1	0.92	92	20-160	
n-Octacosane (S)	%			82	50-150	
o-Terphenyl (S)	%			82	50-150	

SAMPLE DUPLICATE: 87630

Parameter	Units	259304001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.025	0.031	22	
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	62	77	22	
o-Terphenyl (S)	%	63	77	19	

SAMPLE DUPLICATE: 87631

Parameter	Units	259304008 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.084	0.095	12	
Motor Oil Range	mg/L	ND	0.14		
n-Octacosane (S)	%	76	82	7	
o-Terphenyl (S)	%	75	83	11	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 259304

QC Batch: OEXT/4427

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 259304017, 259304020

METHOD BLANK: 87649

Matrix: Water

Associated Lab Samples: 259304017, 259304020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	0.024	0.020	09/29/11 14:31	1n
Motor Oil Range	mg/L	ND	0.10	09/29/11 14:31	
n-Octacosane (S)	%	80	50-150	09/29/11 14:31	
o-Terphenyl (S)	%	78	50-150	09/29/11 14:31	

LABORATORY CONTROL SAMPLE: 87650

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1	0.72	72	51-147	
Motor Oil Range	mg/L	1	0.83	83	20-160	
n-Octacosane (S)	%			77	50-150	
o-Terphenyl (S)	%			77	50-150	

SAMPLE DUPLICATE: 87651

Parameter	Units	259304017 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.024	0.038	45	B+
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	64	51	23	P2
o-Terphenyl (S)	%	64	52	20	



## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 259304

QC Batch: OEXT/4468

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 259304018, 259304019, 259304021, 259304022, 259304023, 259304024

METHOD BLANK: 88835

Matrix: Water

Associated Lab Samples: 259304018, 259304019, 259304021, 259304022, 259304023, 259304024

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	10/04/11 13:02	
Motor Oil Range	mg/L	ND	0.10	10/04/11 13:02	
n-Octacosane (S)	%	81	50-150	10/04/11 13:02	
o-Terphenyl (S)	%	81	50-150	10/04/11 13:02	

LABORATORY CONTROL SAMPLE: 88836

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1	0.87	87	51-147	
Motor Oil Range	mg/L	1	0.95	95	20-160	
n-Octacosane (S)	%			87	50-150	
o-Terphenyl (S)	%			89	50-150	

SAMPLE DUPLICATE: 88837

Parameter	Units	259311005 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	54	63	15	
o-Terphenyl (S)	%	54	61	13	

## QUALIFIERS

Project: BNSF-Skykomish

Pace Project No.: 259304

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-S Pace Analytical Services - Seattle

### ANALYTE QUALIFIERS

- |    |  |
|----|--|
| 1n | The reported result for this analyte is above the reporting limit in the method blank. |
| B+ | Analyte was detected in the associated method blank as well as in the sample.          |
| B- | Analyte detected in method blank but was not detected in the associated samples.       |
| P2 | Re-extraction or re-analysis could not be performed due to insufficient sample amount. |

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF-Skykomish

Pace Project No.: 259304

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
259304001	MW-4-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304002	MW-400-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304003	ZA-W-10-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304004	ZA-W-9-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304005	ZB-W-4-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304006	MW-3-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304007	S-W-43-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304008	GW-1-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304009	IC-W-1-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304010	IC-W-8-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304011	IC-W-3-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304012	IC-W-4-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304013	IC-W-7-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304014	IB-W-2-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304015	IB-W-3-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304016	MW-38R-0911	EPA 3510	OEXT/4425	NWTPH-Dx	GCSV/2930
259304017	EW-1-0911	EPA 3510	OEXT/4427	NWTPH-Dx	GCSV/2931
259304018	ZA-W-41-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259304019	ZA-W-40-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259304020	ZA-W-400-0911	EPA 3510	OEXT/4427	NWTPH-Dx	GCSV/2931
259304021	GW-3-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259304022	GW-30-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259304023	ZA-W-42-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259304024	GW-4-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952

CHAIN-OF-CUSTODY / Analytical Request Document  
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

259304

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company:	BNSF	Report To:	AECOM Renee Knicht	Attention:	Bruce Sheppard
Address:		Copy To:	Dean Kinyu	Company Name:	BNSF
Email To:		Purchase Order No.:	TT0106-339	Address:	
Phone:		Project Name:	SEK Komish	Pace Quote Reference:	
Requested Due Date/TAT:	Std	Project Number:	60191113	Pace Project Manager:	
				Pace Profile #:	
			<b>REGULATORY AGENCY</b>		
			<input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER		
			<input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER		
			Site Location STATE: WA		

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	Matrix Code (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	DATE	TIME	DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab ID
1	MW-4	D911			9/19/11	10:05			11.2	2					
2	MW-460					10:20			11.2	2					
3	2A-W-9					10:45			11.0	2					
4	2A-W-9					11:15			11.2	2					
5	2B-W-4					13:10			11.9	2					
6	MW-3					13:55			13.7	2					
7	5-W-43					14:50			11.1	2					
8	GW-1					9/21/11	15:45		21.2	2					
9	1C-W-1					9/21/11	10:20		11.6	2					
10	1C-W-8					11:10			11.0	2					
11	1C-W-3					12:00			18.2	2					
12	1C-W-4					14:40			10.2	2					

ADDITIONAL COMMENTS		RELINQUISHED BY / AFFILIATION		DATE		TIME		ACCEPTED BY / AFFILIATION		DATE		TIME		SAMPLE CONDITIONS	
		Mindy J. J. AECOM		9/21/11		0845		Caitie Wallace / PACE		0921/11		0845		Y N Y	
SAMPLER NAME AND SIGNATURE															
PRINT Name of SAMPLER: Mindy J. J.															
SIGNATURE of SAMPLER: Mindy J. J.															
DATE Signed (MM/DD/YY): 9/21/11															
Temp in °C															
Received on Ice (Y/N)															
Custody Sealed Cooler (Y/N)															
Samples Intact (Y/N)															







# Sample Container Count

CLIENT:

AECOM

COC PAGE

1 of 2

COC ID#

1470477



Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU				Comments
1		2													
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															Trip Blank? NO

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFY	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		

# Sample Container Count

CLIENT:

AECOM

COC PAGE

2 of 2

COC ID#

1470479



259304

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU					Comments
1		2														
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																Trip Blank? NO

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber voa vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFY	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		





# Sample Condition Upon Receipt

Client Name: AECOM

Project #

259304

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace Other

Tracking #:

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No Seals intact: ☐ Yes ☐ No

Packing Material: ☒ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other Temp. Blank Yes ☒ No

Thermometer Used 132013 or 101731962 or 226099 Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 5.8, 6.0, 6.3, 5.8, 1.9, 4.4 Biological Tissue is Frozen: Yes No

Temp should be above freezing  $\leq 6^{\circ}\text{C}$  6.4, 2.8, 1.0, 5.5

Comments:

Date and Initials of person examining contents: 09/21/11 CW

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Follow Up / Hold Analysis Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	8.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
-Includes date/time/ID/Analysis Matrix:	<u>WT</u>	<u>2/10 coolers out of temp.</u>
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G		Initial when completed
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blanks Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	17.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Creation Date:		

Client Notification/ Resolution:

Person Contacted:

Mark H

Date/Time:

09/21/11 1649

Field Data Required?

Y / N

Comments/ Resolution:

Received email confirmation to go ahead with analysis

Project Manager Review:

NJB

Date:

09/21/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

**Andy Brownfield - RE: scanned copies of Skykomish samples**

---

**From:** "Havighorst, Mark" <Mark.Havighorst@aecom.com>  
**To:** Andy Brownfield <Andy.Brownfield@pacelabs.com>  
**Date:** 9/21/2011 4:49 PM  
**Subject:** RE: scanned copies of Skykomish samples  
**CC:** "Knecht, Renee" <Renee.Knecht@aecom.com>

---

Hi Jyothi – please go ahead and run the analyses on samples that were received at the elevated temperatures.  
Thanks.

**Mark Havighorst, PE**  
Senior Project Manager  
Environment  
D 503.227.1042 x24 M 503.360.3308  
[mark.havighorst@aecom.com](mailto:mark.havighorst@aecom.com)

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Please consider the environment before printing this e-mail.

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**From:** Knecht, Renee  
**Sent:** Wednesday, September 21, 2011 4:38 PM  
**To:** Havighorst, Mark  
**Subject:** FW: scanned copies of Skykomish samples

These are the cocs. The samples were collected on 9/19 and 9/20.

Also attached is the v-mail I got from Pace.

Renee Knecht, L.G.  
Geologist  
AECOM Environment  
tel: 206.624.9349

direct: 206.403.4259

---

**From:** Andy Brownfield [mailto:[Andy.Brownfield@pacelabs.com](mailto:Andy.Brownfield@pacelabs.com)]  
**Sent:** Wednesday, September 21, 2011 4:35 PM

October 06, 2011

Mark Havighorst  
AECOM - BNSF  
333 SW 5th Avenue, Suite 225  
Portland, OR 97204

RE: Project: BNSF-Skykomish  
Pace Project No.: 259311

Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on September 21, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards, where applicable, unless otherwise narrated in the body of the report.

The samples were received outside of required temperature range, for two coolers. Analysis was completed upon client approval.

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

Sincerely,



Andy Brownfield

andy.brownfield@pacelabs.com  
Project Manager

Enclosures

cc: Renee Knecht, AECOM (BNSF)  
Jennifer Wald, AECOM (BNSF)



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: BNSF-Skykomish

Pace Project No.: 259311

### Washington Certification IDs

940 South Harney Street, Seattle, WA 98108

Alaska CS Certification #: UST-025

Arizona Certification #: AZ0770

California Certification #: 01153CA

Florida/NELAP Certification #: E87617

Oregon Certification #: WA200007

Washington Certification #: C555

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE ANALYTE COUNT

Project: BNSF-Skykomish

Pace Project No.: 259311

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
259311001	S1-AU-0911	NWTPH-Dx	AY1	4	PASI-S
259311002	S1-AD-0911	NWTPH-Dx	AY1	4	PASI-S
259311003	S1-BU-0911	NWTPH-Dx	AY1	4	PASI-S
259311004	S1-BD-0911	NWTPH-Dx	AY1	4	PASI-S
259311005	S2-AU-0911	NWTPH-Dx	AY1	4	PASI-S
259311006	S2-AD-0911	NWTPH-Dx	AY1	4	PASI-S
259311007	S2-BU-0911	NWTPH-Dx	AY1	4	PASI-S
259311008	S2-BD-0911	NWTPH-Dx	AY1	4	PASI-S
259311009	S3-AU-0911	NWTPH-Dx	AY1	4	PASI-S
259311010	S30-AU-0911	NWTPH-Dx	AY1	4	PASI-S
259311011	S3-AD-0911	NWTPH-Dx	AY1	4	PASI-S
259311012	S3-BU-0911	NWTPH-Dx	AY1	4	PASI-S
259311013	S3-CU-0911	NWTPH-Dx	AY1	4	PASI-S
259311014	S3-CD-0911	NWTPH-Dx	AY1	4	PASI-S
259311015	S4-AU-0911	NWTPH-Dx	AY1	4	PASI-S
259311016	S40-AU-0911	NWTPH-Dx	AY1	4	PASI-S
259311017	S4-AD-0911	NWTPH-Dx	AY1	4	PASI-S
259311018	S4-BD-0911	NWTPH-Dx	AY1	4	PASI-S
259311019	S4-BU-0911	NWTPH-Dx	AY1	4	PASI-S
259311020	S4-CD-0911	NWTPH-Dx	AY1	4	PASI-S
259311021	S4-CU-0911	NWTPH-Dx	AY1	4	PASI-S
259311022	S3-BD-0911	NWTPH-Dx	AY1	4	PASI-S

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259311

Sample: S1-AU-0911		Lab ID: 259311001		Collected: 09/20/11 15:20		Received: 09/21/11 08:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.019	1	10/04/11 06:05	10/04/11 15:50		
Motor Oil Range		ND mg/L		0.094	1	10/04/11 06:05	10/04/11 15:50	64742-65-0	
n-Octacosane (S)		70 %		50-150	1	10/04/11 06:05	10/04/11 15:50	630-02-4	
o-Terphenyl (S)		72 %		50-150	1	10/04/11 06:05	10/04/11 15:50	84-15-1	

Sample: S1-AD-0911		Lab ID: 259311002		Collected: 09/20/11 15:25		Received: 09/21/11 08:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.019	1	10/04/11 06:05	10/04/11 16:06		
Motor Oil Range		ND mg/L		0.094	1	10/04/11 06:05	10/04/11 16:06	64742-65-0	
n-Octacosane (S)		68 %		50-150	1	10/04/11 06:05	10/04/11 16:06	630-02-4	
o-Terphenyl (S)		69 %		50-150	1	10/04/11 06:05	10/04/11 16:06	84-15-1	

Sample: S1-BU-0911		Lab ID: 259311003		Collected: 09/20/11 15:30		Received: 09/21/11 08:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.019	1	10/04/11 06:05	10/04/11 16:24		
Motor Oil Range		ND mg/L		0.094	1	10/04/11 06:05	10/04/11 16:24	64742-65-0	
n-Octacosane (S)		57 %		50-150	1	10/04/11 06:05	10/04/11 16:24	630-02-4	
o-Terphenyl (S)		60 %		50-150	1	10/04/11 06:05	10/04/11 16:24	84-15-1	

Sample: S1-BD-0911		Lab ID: 259311004		Collected: 09/20/11 15:35		Received: 09/21/11 08:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.047 mg/L		0.019	1	10/04/11 06:05	10/04/11 17:06		
Motor Oil Range		0.32 mg/L		0.094	1	10/04/11 06:05	10/04/11 17:06	64742-65-0	
n-Octacosane (S)		63 %		50-150	1	10/04/11 06:05	10/04/11 17:06	630-02-4	
o-Terphenyl (S)		65 %		50-150	1	10/04/11 06:05	10/04/11 17:06	84-15-1	

Sample: S2-AU-0911		Lab ID: 259311005		Collected: 09/20/11 16:00		Received: 09/21/11 08:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.019	1	10/04/11 06:05	10/04/11 17:22		
Motor Oil Range		ND mg/L		0.094	1	10/04/11 06:05	10/04/11 17:22	64742-65-0	

Date: 10/06/2011 12:36 PM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259311

Sample: S2-AU-0911		Lab ID: 259311005		Collected: 09/20/11 16:00	Received: 09/21/11 08:45	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

n-Octacosane (S)	54 %		50-150	1	10/04/11 06:05	10/04/11 17:22	630-02-4	
o-Terphenyl (S)	54 %		50-150	1	10/04/11 06:05	10/04/11 17:22	84-15-1	

Sample: S2-AD-0911		Lab ID: 259311006	Collected: 09/20/11 16:05	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	ND mg/L		0.019	1	09/28/11 13:35	09/29/11 20:22		B-
Motor Oil Range	ND mg/L		0.095	1	09/28/11 13:35	09/29/11 20:22	64742-65-0	
n-Octacosane (S)	77 %		50-150	1	09/28/11 13:35	09/29/11 20:22	630-02-4	
o-Terphenyl (S)	77 %		50-150	1	09/28/11 13:35	09/29/11 20:22	84-15-1	

Sample: S2-BU-0911		Lab ID: 259311007	Collected: 09/20/11 16:20	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	ND mg/L		0.019	1	10/04/11 06:05	10/04/11 17:56		
Motor Oil Range	ND mg/L		0.094	1	10/04/11 06:05	10/04/11 17:56	64742-65-0	
n-Octacosane (S)	71 %		50-150	1	10/04/11 06:05	10/04/11 17:56	630-02-4	
o-Terphenyl (S)	72 %		50-150	1	10/04/11 06:05	10/04/11 17:56	84-15-1	

Sample: S2-BD-0911		Lab ID: 259311008	Collected: 09/20/11 16:25	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.047 mg/L		0.019	1	10/04/11 06:05	10/04/11 18:12		
Motor Oil Range	0.13 mg/L		0.094	1	10/04/11 06:05	10/04/11 18:12	64742-65-0	
n-Octacosane (S)	62 %		50-150	1	10/04/11 06:05	10/04/11 18:12	630-02-4	
o-Terphenyl (S)	64 %		50-150	1	10/04/11 06:05	10/04/11 18:12	84-15-1	

Sample: S3-AU-0911		Lab ID: 259311009	Collected: 09/20/11 16:40	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	ND mg/L		0.019	1	10/04/11 06:05	10/04/11 18:29		
Motor Oil Range	ND mg/L		0.094	1	10/04/11 06:05	10/04/11 18:29	64742-65-0	
n-Octacosane (S)	72 %		50-150	1	10/04/11 06:05	10/04/11 18:29	630-02-4	
o-Terphenyl (S)	70 %		50-150	1	10/04/11 06:05	10/04/11 18:29	84-15-1	

Date: 10/06/2011 12:36 PM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259311

Sample: S30-AU-0911		Lab ID: 259311010		Collected: 09/20/11 16:45		Received: 09/21/11 08:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range	ND mg/L		0.019	1	09/30/11 10:00	09/30/11 19:34			B-
Motor Oil Range	ND mg/L		0.095	1	09/30/11 10:00	09/30/11 19:34	64742-65-0		
n-Octacosane (S)	71 %		50-150	1	09/30/11 10:00	09/30/11 19:34	630-02-4		
o-Terphenyl (S)	71 %		50-150	1	09/30/11 10:00	09/30/11 19:34	84-15-1		

Sample: S3-AD-0911		Lab ID: 259311011		Collected: 09/20/11 17:10		Received: 09/21/11 08:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.019	1	09/30/11 10:00	09/30/11 20:08		B-
Motor Oil Range		ND mg/L		0.095	1	09/30/11 10:00	09/30/11 20:08	64742-65-0	
n-Octacosane (S)		83 %		50-150	1	09/30/11 10:00	09/30/11 20:08	630-02-4	
o-Terphenyl (S)		79 %		50-150	1	09/30/11 10:00	09/30/11 20:08	84-15-1	

Sample: S3-BU-0911		Lab ID: 259311012		Collected: 09/20/11 17:15		Received: 09/21/11 08:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.11 mg/L		0.019	1	10/04/11 06:05	10/04/11 19:20		
Motor Oil Range		ND mg/L		0.094	1	10/04/11 06:05	10/04/11 19:20	64742-65-0	
n-Octacosane (S)		74 %		50-150	1	10/04/11 06:05	10/04/11 19:20	630-02-4	
o-Terphenyl (S)		75 %		50-150	1	10/04/11 06:05	10/04/11 19:20	84-15-1	

Sample: S3-CU-0911		Lab ID: 259311013		Collected: 09/20/11 17:35		Received: 09/21/11 08:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.019	1	09/30/11 10:00	09/30/11 21:15		B-
Motor Oil Range		ND mg/L		0.095	1	09/30/11 10:00	09/30/11 21:15	64742-65-0	
n-Octacosane (S)		84 %		50-150	1	09/30/11 10:00	09/30/11 21:15	630-02-4	
o-Terphenyl (S)		81 %		50-150	1	09/30/11 10:00	09/30/11 21:15	84-15-1	

Sample: S3-CD-0911		Lab ID: 259311014		Collected: 09/20/11 17:40		Received: 09/21/11 08:45		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.019	1	09/30/11 10:00	09/30/11 21:31		B-
Motor Oil Range		ND mg/L		0.094	1	09/30/11 10:00	09/30/11 21:31	64742-65-0	

Date: 10/06/2011 12:36 PM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259311

Sample: S3-CD-0911		Lab ID: 259311014	Collected: 09/20/11 17:40	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

n-Octacosane (S)	84 %		50-150	1	09/30/11 10:00	09/30/11 21:31	630-02-4	
o-Terphenyl (S)	81 %		50-150	1	09/30/11 10:00	09/30/11 21:31	84-15-1	

Sample: S4-AU-0911		Lab ID: 259311015	Collected: 09/20/11 18:10	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	ND mg/L		0.019	1	10/04/11 06:05	10/04/11 19:37		
Motor Oil Range	ND mg/L		0.094	1	10/04/11 06:05	10/04/11 19:37	64742-65-0	
n-Octacosane (S)	74 %		50-150	1	10/04/11 06:05	10/04/11 19:37	630-02-4	
o-Terphenyl (S)	71 %		50-150	1	10/04/11 06:05	10/04/11 19:37	84-15-1	

Sample: S40-AU-0911		Lab ID: 259311016	Collected: 09/20/11 18:15	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	ND mg/L		0.019	1	10/04/11 06:05	10/04/11 19:53		
Motor Oil Range	ND mg/L		0.094	1	10/04/11 06:05	10/04/11 19:53	64742-65-0	
n-Octacosane (S)	75 %		50-150	1	10/04/11 06:05	10/04/11 19:53	630-02-4	
o-Terphenyl (S)	71 %		50-150	1	10/04/11 06:05	10/04/11 19:53	84-15-1	

Sample: S4-AD-0911		Lab ID: 259311017	Collected: 09/20/11 18:20	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.025 mg/L		0.019	1	10/04/11 19:30	10/05/11 14:24		
Motor Oil Range	ND mg/L		0.094	1	10/04/11 19:30	10/05/11 14:24	64742-65-0	
n-Octacosane (S)	68 %		50-150	1	10/04/11 19:30	10/05/11 14:24	630-02-4	
o-Terphenyl (S)	67 %		50-150	1	10/04/11 19:30	10/05/11 14:24	84-15-1	

Sample: S4-BD-0911		Lab ID: 259311018	Collected: 09/20/11 18:25	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	ND mg/L		0.020	1	09/30/11 10:00	09/30/11 22:37		B-
Motor Oil Range	ND mg/L		0.098	1	09/30/11 10:00	09/30/11 22:37	64742-65-0	
n-Octacosane (S)	80 %		50-150	1	09/30/11 10:00	09/30/11 22:37	630-02-4	
o-Terphenyl (S)	75 %		50-150	1	09/30/11 10:00	09/30/11 22:37	84-15-1	

Date: 10/06/2011 12:36 PM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259311

<b>Sample: S4-BU-0911</b>		<b>Lab ID: 259311019</b>	Collected: 09/20/11 18:30	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.061	mg/L	0.020	1	10/04/11 19:30	10/05/11 14:40		
Motor Oil Range	0.17	mg/L	0.10	1	10/04/11 19:30	10/05/11 14:40	64742-65-0	
n-Octacosane (S)	67	%	50-150	1	10/04/11 19:30	10/05/11 14:40	630-02-4	
o-Terphenyl (S)	71	%	50-150	1	10/04/11 19:30	10/05/11 14:40	84-15-1	

<b>Sample: S4-CD-0911</b>		<b>Lab ID: 259311020</b>	Collected: 09/20/11 18:40	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.025	mg/L	0.019	1	10/04/11 19:30	10/05/11 14:57		
Motor Oil Range	ND	mg/L	0.096	1	10/04/11 19:30	10/05/11 14:57	64742-65-0	
n-Octacosane (S)	58	%	50-150	1	10/04/11 19:30	10/05/11 14:57	630-02-4	
o-Terphenyl (S)	61	%	50-150	1	10/04/11 19:30	10/05/11 14:57	84-15-1	

<b>Sample: S4-CU-0911</b>		<b>Lab ID: 259311021</b>	Collected: 09/20/11 18:45	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.042	mg/L	0.019	1	10/04/11 19:30	10/05/11 15:14		
Motor Oil Range	ND	mg/L	0.096	1	10/04/11 19:30	10/05/11 15:14	64742-65-0	
n-Octacosane (S)	77	%	50-150	1	10/04/11 19:30	10/05/11 15:14	630-02-4	
o-Terphenyl (S)	79	%	50-150	1	10/04/11 19:30	10/05/11 15:14	84-15-1	

<b>Sample: S3-BD-0911</b>		<b>Lab ID: 259311022</b>	Collected: 09/20/11 17:15	Received: 09/21/11 08:45	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.019	1	10/04/11 19:30	10/05/11 15:31		
Motor Oil Range	ND	mg/L	0.096	1	10/04/11 19:30	10/05/11 15:31	64742-65-0	
n-Octacosane (S)	68	%	50-150	1	10/04/11 19:30	10/05/11 15:31	630-02-4	
o-Terphenyl (S)	64	%	50-150	1	10/04/11 19:30	10/05/11 15:31	84-15-1	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 259311

QC Batch: OEXT/4427

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 259311006

METHOD BLANK: 87649

Matrix: Water

Associated Lab Samples: 259311006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	0.024	0.020	09/29/11 14:31	3n
Motor Oil Range	mg/L	ND	0.10	09/29/11 14:31	
n-Octacosane (S)	%	80	50-150	09/29/11 14:31	
o-Terphenyl (S)	%	78	50-150	09/29/11 14:31	

LABORATORY CONTROL SAMPLE: 87650

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1	0.72	72	51-147	
Motor Oil Range	mg/L	1	0.83	83	20-160	
n-Octacosane (S)	%			77	50-150	
o-Terphenyl (S)	%			77	50-150	

SAMPLE DUPLICATE: 87651

Parameter	Units	259304017 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.024	0.038	45	B+
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	64	51	23	P2
o-Terphenyl (S)	%	64	52	20	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 259311

QC Batch: OEXT/4440

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 259311010, 259311011, 259311013, 259311014, 259311018

METHOD BLANK: 88090

Matrix: Water

Associated Lab Samples: 259311010, 259311011, 259311013, 259311014, 259311018

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	0.025	0.020	09/30/11 18:44	2n
Motor Oil Range	mg/L	ND	0.10	09/30/11 18:44	
n-Octacosane (S)	%	73	50-150	09/30/11 18:44	
o-Terphenyl (S)	%	75	50-150	09/30/11 18:44	

LABORATORY CONTROL SAMPLE: 88091

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1	0.69	69	51-147	
Motor Oil Range	mg/L	1	0.76	76	20-160	
n-Octacosane (S)	%			73	50-150	
o-Terphenyl (S)	%			77	50-150	

SAMPLE DUPLICATE: 88092

Parameter	Units	259311010 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND	0.022		B+
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	71	77	9	
o-Terphenyl (S)	%	71	74	5	

SAMPLE DUPLICATE: 88093

Parameter	Units	259314002 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	1.0	1.2	15	1n
Motor Oil Range	mg/L	0.50	0.63	23	
n-Octacosane (S)	%	69	74	7	
o-Terphenyl (S)	%	70	77	9	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 259311

QC Batch: OEXT/4461

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 259311017, 259311019, 259311020, 259311021, 259311022

METHOD BLANK: 88741

Matrix: Water

Associated Lab Samples: 259311017, 259311019, 259311020, 259311021, 259311022

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	10/05/11 12:21	
Motor Oil Range	mg/L	ND	0.10	10/05/11 12:21	
n-Octacosane (S)	%	76	50-150	10/05/11 12:21	
o-Terphenyl (S)	%	78	50-150	10/05/11 12:21	

LABORATORY CONTROL SAMPLE: 88742

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1	0.81	81	51-147	
Motor Oil Range	mg/L	1	0.85	85	20-160	
n-Octacosane (S)	%			74	50-150	
o-Terphenyl (S)	%			78	50-150	

SAMPLE DUPLICATE: 88743

Parameter	Units	259468001 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.23	0.28	19	
Motor Oil Range	mg/L	0.26J	.31J		
n-Octacosane (S)	%	82	83	1	
o-Terphenyl (S)	%	87	89	2	



## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 259311

QC Batch:	OEXT/4468	Analysis Method:	NWTPH-Dx
QC Batch Method:	EPA 3510	Analysis Description:	NWTPH-Dx GCS
Associated Lab Samples:	259311001, 259311002, 259311003, 259311004, 259311005, 259311007, 259311008, 259311009, 259311012, 259311015, 259311016		

METHOD BLANK: 88835 Matrix: Water

Associated Lab Samples: 259311001, 259311002, 259311003, 259311004, 259311005, 259311007, 259311008, 259311009, 259311012, 259311015, 259311016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	10/04/11 13:02	
Motor Oil Range	mg/L	ND	0.10	10/04/11 13:02	
n-Octacosane (S)	%	81	50-150	10/04/11 13:02	
o-Terphenyl (S)	%	81	50-150	10/04/11 13:02	

LABORATORY CONTROL SAMPLE: 88836

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1	0.87	87	51-147	
Motor Oil Range	mg/L	1	0.95	95	20-160	
n-Octacosane (S)	%			87	50-150	
o-Terphenyl (S)	%			89	50-150	

SAMPLE DUPLICATE: 88837

Parameter	Units	259311005 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND	ND		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	54	63	15	
o-Terphenyl (S)	%	54	61	13	

## QUALIFIERS

Project: BNSF-Skykomish

Pace Project No.: 259311

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-S Pace Analytical Services - Seattle

### ANALYTE QUALIFIERS

- |    |   |
|----|---|
| 1n | Analyte result in the method blank is above the reporting limit (RL.) Sample acceptance is based upon each associated sample containing analyte results at least 10-times greater than that of the method blank, as per NELAC standard. |
| 2n | The reported result for this analyte in the method blank is above the reporting limit.  |
| 3n | The reported result for this analyte is above the reporting limit in the method blank.  |
| B+ | Analyte was detected in the associated method blank as well as in the sample.   |
| B- | Analyte detected in method blank but was not detected in the associated samples.  |
| P2 | Re-extraction or re-analysis could not be performed due to insufficient sample amount.  |

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF-Skykomish

Pace Project No.: 259311

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
259311001	S1-AU-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259311002	S1-AD-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259311003	S1-BU-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259311004	S1-BD-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259311005	S2-AU-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259311006	S2-AD-0911	EPA 3510	OEXT/4427	NWTPH-Dx	GCSV/2931
259311007	S2-BU-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259311008	S2-BD-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259311009	S3-AU-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259311010	S30-AU-0911	EPA 3510	OEXT/4440	NWTPH-Dx	GCSV/2938
259311011	S3-AD-0911	EPA 3510	OEXT/4440	NWTPH-Dx	GCSV/2938
259311012	S3-BU-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259311013	S3-CU-0911	EPA 3510	OEXT/4440	NWTPH-Dx	GCSV/2938
259311014	S3-CD-0911	EPA 3510	OEXT/4440	NWTPH-Dx	GCSV/2938
259311015	S4-AU-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259311016	S40-AU-0911	EPA 3510	OEXT/4468	NWTPH-Dx	GCSV/2952
259311017	S4-AD-0911	EPA 3510	OEXT/4461	NWTPH-Dx	GCSV/2950
259311018	S4-BD-0911	EPA 3510	OEXT/4440	NWTPH-Dx	GCSV/2938
259311019	S4-BU-0911	EPA 3510	OEXT/4461	NWTPH-Dx	GCSV/2950
259311020	S4-CD-0911	EPA 3510	OEXT/4461	NWTPH-Dx	GCSV/2950
259311021	S4-CU-0911	EPA 3510	OEXT/4461	NWTPH-Dx	GCSV/2950
259311022	S3-BD-0911	EPA 3510	OEXT/4461	NWTPH-Dx	GCSV/2950



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

2593.11

Page: 1 of 2  
**1470478**

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: <u>BNSF</u>		Report To: <u>AECOM Renee Knecht</u>		Attention: <u>Bruce Sheppard</u>	
Address:		Copy To: <u>Dean Kinney</u>		Company Name: <u>BNSF</u>	
Email To:		Purchase Order No.: <u>TT0100-J39</u>		Address:	
Phone:		Project Name: <u>skykomish</u>		Pace Quote Reference:	
Fax:		Project Number: <u>60191113</u>		Pace Project Manager:	
Requested Due Date/TAT: <u>std</u>				Pace Profile #:	
<b>REGULATORY AGENCY</b> <input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER _____					
<b>Site Location</b> STATE: <u>WA</u>					

ITEM #	Section D Required Client Information		Matrix Codes MATRIX / CODE		MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test ↓	Y/N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS		
Without SGBU - S10 ga gel cleanup sample SZ-AU-0911 has extra volume for MS/MSD	Mindy Juddon AECOM	9/21/11	0845	Collette Weaver/PACE	092111	0845	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: <u>Mindy Juddon</u>	DATE Signed (MM/DD/YY): <u>09/21/11</u>				



**CHAIN-OF-CUSTODY / Analytical Request Document**  
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

259311

**Section A**

Required Client Information:

Company: BNSF  
Address: Dea Klnby  
Report To: AEDM Renee Knack  
Copy To: Dea Klnby  
Attention: Bruce Shepard  
Company Name: BNSF

**Section B**

Required Project Information:

Email To: TIQID0-539  
Purchase Order No.: SKPKOM15  
Phone: 60191113  
Project Name: SKPKOM15  
Project Number: 60191113  
Requested Due Date/TAT: 5+1

**Section C**

Invoice Information:

Address: BNSF  
Pace Quote Reference: BNSF  
Pace Project Manager: BNSF  
Pace Profile #: BNSF

Page: 2 of 2

1470476

**REGULATORY AGENCY**

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER

Site Location

STATE: WA

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information	Matrix Codes MATRIX / CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	DATE	TIME	DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test	Residual Chlorine (Y/N)	Pace Project No./ Lab ID
1	SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE	Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Tissue Other	DW WT WW P SL OL WP AR TS OT											
2	S3 - CU				9/20/11	1735				2				
3	S3 - CD				9/20/11	1740				2				
4	S4 - AU				9/20/11	1810				2				
5	S4 - AD				9/20/11	1815				2				
6	S4 - BD				9/20/11	1820				2				
7	S4 - BU				9/20/11	1825				2				
8	S4 - CU				9/20/11	1830				2				
9	S4 - CU				9/20/11	1840				2				
10					9/20/11	1845				2				
11														
12														

**ADDITIONAL COMMENTS**

**RELINQUISHED BY / AFFILIATION**

**DATE**

**TIME**

**ACCEPTED BY / AFFILIATION**

**DATE**

**TIME**

**SAMPLE CONDITIONS**

Additional Comments: with out silica gel cleanup Henry Jackson Hecan  
Relinquished By / Affiliation: Henry Jackson Hecan  
Date: 9/21/11  
Time: 0845  
Accepted By / Affiliation: DATA WAREHOUSE / PACE  
Date: 0921/11  
Time: 0845  
Sample Conditions: Temp in °C  
Received on Ice (Y/N)  
Custody Sealed Cooler (Y/N)  
Samples Intact (Y/N)

ORIGINAL

**SAMPLER NAME AND SIGNATURE**  
PRINT Name of SAMPLER: Henry Jackson  
SIGNATURE of SAMPLER: Henry Jackson  
DATE Signed (MM/DD/YY): 09/21/11  
Temp in °C: 5.8°C, 6.0°C, 6.3°C, 5.8°C, 1.9°C, 4.4°C, 6.4°C, 2.8°C, 1.0°C, 5.5°C



**Sample Condition Upon Receipt**Client Name: AECOM

Project #

259311Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace Other \_\_\_\_\_

Tracking #: \_\_\_\_\_

Custody Seal on Cooler/Box Present: ☐ Yes ☒ No Seals intact: ☐ Yes ☐ NoPacking Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other \_\_\_\_\_ Temp. Blank Yes ☒ NoThermometer Used 132013 or 101731992 or 226099 Type of Ice: Wet Blue None ☐ Samples on ice, cooling process has begunCooler Temperature 58, 60, 63, 58, 19, 44 Biological Tissue is Frozen: Yes NoTemp should be above freezing  $\leq 6^{\circ}\text{C}$  64, 28, 10, 55

Comments:

Date and Initials of person examining contents: 09/21/11 CN

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Follow Up / Hold Analysis Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	8.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
-Includes date/time/ID/Analysis Matrix:	<u>WT</u>	
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, coliform, TOC, O&G		
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blanks Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	17.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Creation Date:		

Client Notification/ Resolution:

Person Contacted:

Mark H.

Date/Time:

09/21/11 1649

Field Data Required?

Y / N

Comments/ Resolution:

Received withemail analysis.confirmation togo ahead

Project Manager Review:

NJB

Date:

09/21/11

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

# Sample Container Count

CLIENT:

AECOM



COC PAGE 1 of 2

COC ID# 1470428

259311

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU					Comments
1		2 <sup>nd</sup>														
2		↓														
3																
4		↓														
5		6														
6		2														
7		↓														
8																
9																
10																
11																
12		↓ ↓														Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber voa vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFU	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		



# Sample Container Count

CLIENT:

AECOM



COC PAGE

2 of 2

COC ID#

1470476

259311

Sample Line Item	VG9H	AG1H	AG1U	BG1H	BP1U	BP2U	BP3U	BP2N	BP2S	WGFU	WGKU					Comments
1		2														
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																Trip Blank? No

AG1H	1 liter HCL amber glass		BP2S	500mL H2SO4 plastic	JGFU	4oz unpreserved amber wide
AG1U	1 liter unpreserved amber glass		BP2U	500mL unpreserved plastic	R	terra core kit
AG2S	500mL H2SO4 amber glass		BP2Z	500mL NaOH, Zn Ac	U	Summa Can
AG2U	500mL unpreserved amber glass		BP3C	250mL NaOH plastic	VG9H	40mL HCL clear vial
AG3S	250mL H2SO4 amber glass		BP3N	250mL HNO3 plastic	VG9T	40mL Na Thio. clear vial
BG1H	1 liter HCL clear glass		BP3S	250mL H2SO4 plastic	VG9U	40mL unpreserved clear vial
BG1U	1 liter unpreserved glass		BP3U	250mL unpreserved plastic	VG9W	40mL glass vial preweighted (EPA 5035)
BP1N	1 liter HNO3 plastic		DG9B	40mL Na Bisulfate amber vial	VSG	Headspace septa vial & HCL
BP1S	1 liter H2SO4 plastic		DG9H	40mL HCL amber vial	WGFU	4oz clear soil jar
BP1U	1 liter unpreserved plastic		DG9M	40mL MeOH clear vial	WGFU	4oz wide jar w/hexane wipe
BP1Z	1 liter NaOH, Zn, Ac		DG9T	40mL Na Thio amber vial	ZPLC	Ziploc Bag
BP2N	500mL HNO3 plastic		DG9U	40mL unpreserved amber vial		
BP2O	500mL NaOH plastic		I	Wipe/Swab		

**Andy Brownfield - RE: Skykomish 6019113 S1-S4**

---

**From:** "Kinney, Dean" <Dean.Kinney@aecom.com>  
**To:** Andy Brownfield <Andy.Brownfield@pacelabs.com>  
**Date:** 9/26/2011 4:15 PM  
**Subject:** RE: Skykomish 6019113 S1-S4

---

Please run sample S3-BD-0911. It appears I thought I had put it on the first page of the COCs and didn't notice that it was not accounted for in the rush to get Mindy on the road .

Thank you!

---

**From:** Andy Brownfield [mailto:Andy.Brownfield@pacelabs.com]  
**Sent:** Friday, September 23, 2011 1:55 PM  
**To:** Kinney, Dean  
**Subject:** RE: Skykomish 6019113 S1-S4

Hi Dean,

attached is the coc.

>>> Andy Brownfield 9/23/2011 1:39 PM >>>  
Hi Dean,

We logged them separately, into WO 259311.

One set of extra bottles was received with this batch, S3-BD-0911. It follows the sequence after sample 12, see attached COC.

Can we go ahead to test them too?

*Jyothi Swamy for Andy Brownfield*

Project Manager  
Pace Analytical Services, Inc.  
940 S. Harney Street  
Seattle, WA 98108  
Direct Line: 206-957-2429  
Fax: 206.767.5063  
[www.pacelabs.com](http://www.pacelabs.com)

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October 18, 2011

Mark Havighorst  
AECOM - BNSF  
333 SW 5th Avenue, Suite 225  
Portland, OR 97204

RE: Project: BNSF-Skykomish  
Pace Project No.: 259314

Dear Mark Havighorst:

Enclosed are the analytical results for sample(s) received by the laboratory on September 22, 2011. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards, where applicable, unless otherwise narrated in the body of the report.

Dx added to samples 5-W-56 & GW-2 per client request on 10/14/11.

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

Sincerely,



Andy Brownfield

andy.brownfield@pacelabs.com  
Project Manager

Enclosures

cc: Renee Knecht, AECOM (BNSF)  
Jennifer Wald, AECOM (BNSF)



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: BNSF-Skykomish

Pace Project No.: 259314

### Washington Certification IDs

940 South Harney Street, Seattle, WA 98108

Alaska CS Certification #: UST-025

Arizona Certification #: AZ0770

California Certification #: 01153CA

Florida/NELAP Certification #: E87617

Oregon Certification #: WA200007

Washington Certification #: C555

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## REPORT OF LABORATORY ANALYSIS

Page 2 of 14

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## SAMPLE ANALYTE COUNT

Project: BNSF-Skykomish

Pace Project No.: 259314

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
259314001	5-W-14-0911	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
259314002	5-W-50-0911	NWTPH-Dx	AY1	4	PASI-S
259314003	5-W-15-0911	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
259314004	5-W-19-0911	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
259314005	5-W-18-0911	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
259314006	5-W-17-0911	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
259314007	5-W-170-0911	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
259314008	5-W-16-0911	NWTPH-Dx	AY1	4	PASI-S
		NWTPH-Dx	AY1	4	PASI-S
259314009	IA-W-4-0911	NWTPH-Dx	AY1	4	PASI-S
259314010	5-W-55-0911	NWTPH-Dx	AY1	4	PASI-S
259314011	5-W-56-0911	NWTPH-Dx	AY1	4	PASI-S
259314012	GW-2-0911	NWTPH-Dx	AY1	4	PASI-S
259314013	EW-2A-0911	NWTPH-Dx	AY1	4	PASI-S
259314014	5-W-51-0911	NWTPH-Dx	AY1	4	PASI-S
259314015	5-W-54-0911	NWTPH-Dx	AY1	4	PASI-S
259314016	MW-16-0911	NWTPH-Dx	AY1	4	PASI-S
259314017	IB-W-23-0911	NWTPH-Dx	AY1	4	PASI-S

## REPORT OF LABORATORY ANALYSIS

Page 3 of 14

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259314

<b>Sample: 5-W-14-0911</b>		<b>Lab ID: 259314001</b>	Collected: 09/21/11 09:10		Received: 09/22/11 08:40		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.019	1	10/03/11 13:05	10/03/11 17:21		
Motor Oil Range	ND	mg/L	0.095	1	10/03/11 13:05	10/03/11 17:21	64742-65-0	
n-Octacosane (S)	67 %		50-150	1	10/03/11 13:05	10/03/11 17:21	630-02-4	
o-Terphenyl (S)	72 %		50-150	1	10/03/11 13:05	10/03/11 17:21	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND	mg/L	0.019	1	10/03/11 13:05	10/04/11 14:59		
Motor Oil Range SG	ND	mg/L	0.095	1	10/03/11 13:05	10/04/11 14:59	64742-65-0	
n-Octacosane (S) SG	69 %		50-150	1	10/03/11 13:05	10/04/11 14:59	630-02-4	
o-Terphenyl (S) SG	77 %		50-150	1	10/03/11 13:05	10/04/11 14:59	84-15-1	

<b>Sample: 5-W-50-0911</b>		<b>Lab ID: 259314002</b>	Collected: 09/21/11 10:00		Received: 09/22/11 08:40		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	1.0	mg/L	0.019	1	09/30/11 10:00	10/03/11 19:51		1n
Motor Oil Range	0.50	mg/L	0.095	1	09/30/11 10:00	10/03/11 19:51	64742-65-0	
n-Octacosane (S)	69 %		50-150	1	09/30/11 10:00	10/03/11 19:51	630-02-4	
o-Terphenyl (S)	70 %		50-150	1	09/30/11 10:00	10/03/11 19:51	84-15-1	

<b>Sample: 5-W-15-0911</b>		<b>Lab ID: 259314003</b>	Collected: 09/21/11 10:30		Received: 09/22/11 08:40		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.17	mg/L	0.019	1	10/03/11 13:05	10/03/11 17:37		
Motor Oil Range	0.14	mg/L	0.095	1	10/03/11 13:05	10/03/11 17:37	64742-65-0	
n-Octacosane (S)	52 %		50-150	1	10/03/11 13:05	10/03/11 17:37	630-02-4	
o-Terphenyl (S)	58 %		50-150	1	10/03/11 13:05	10/03/11 17:37	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	0.067	mg/L	0.019	1	10/03/11 13:05	10/04/11 15:16		
Motor Oil Range SG	ND	mg/L	0.095	1	10/03/11 13:05	10/04/11 15:16	64742-65-0	
n-Octacosane (S) SG	65 %		50-150	1	10/03/11 13:05	10/04/11 15:16	630-02-4	
o-Terphenyl (S) SG	75 %		50-150	1	10/03/11 13:05	10/04/11 15:16	84-15-1	

<b>Sample: 5-W-19-0911</b>		<b>Lab ID: 259314004</b>	Collected: 09/21/11 11:10		Received: 09/22/11 08:40		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.019	1	10/03/11 13:05	10/03/11 17:54		

Date: 10/18/2011 03:14 PM

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259314

<b>Sample: 5-W-19-0911</b>		<b>Lab ID: 259314004</b>	Collected: 09/21/11 11:10	Received: 09/22/11 08:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Motor Oil Range	ND	mg/L	0.095	1	10/03/11 13:05	10/03/11 17:54	64742-65-0	
n-Octacosane (S)	50	%	50-150	1	10/03/11 13:05	10/03/11 17:54	630-02-4	
o-Terphenyl (S)	57	%	50-150	1	10/03/11 13:05	10/03/11 17:54	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND	mg/L	0.019	1	10/03/11 13:05	10/04/11 00:01		
Motor Oil Range SG	ND	mg/L	0.095	1	10/03/11 13:05	10/04/11 00:01	64742-65-0	
n-Octacosane (S) SG	59	%	50-150	1	10/03/11 13:05	10/04/11 00:01	630-02-4	
o-Terphenyl (S) SG	60	%	50-150	1	10/03/11 13:05	10/04/11 00:01	84-15-1	

<b>Sample: 5-W-18-0911</b>		<b>Lab ID: 259314005</b>	Collected: 09/21/11 11:45	Received: 09/22/11 08:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.12	mg/L	0.019	1	10/03/11 13:05	10/03/11 18:11		
Motor Oil Range	0.097	mg/L	0.095	1	10/03/11 13:05	10/03/11 18:11	64742-65-0	
n-Octacosane (S)	71	%	50-150	1	10/03/11 13:05	10/03/11 18:11	630-02-4	
o-Terphenyl (S)	80	%	50-150	1	10/03/11 13:05	10/03/11 18:11	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	0.042	mg/L	0.019	1	10/03/11 13:05	10/04/11 00:17		
Motor Oil Range SG	ND	mg/L	0.095	1	10/03/11 13:05	10/04/11 00:17	64742-65-0	
n-Octacosane (S) SG	81	%	50-150	1	10/03/11 13:05	10/04/11 00:17	630-02-4	
o-Terphenyl (S) SG	87	%	50-150	1	10/03/11 13:05	10/04/11 00:17	84-15-1	

<b>Sample: 5-W-17-0911</b>		<b>Lab ID: 259314006</b>	Collected: 09/21/11 13:40	Received: 09/22/11 08:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND	mg/L	0.019	1	10/03/11 13:05	10/03/11 18:27		
Motor Oil Range	ND	mg/L	0.095	1	10/03/11 13:05	10/03/11 18:27	64742-65-0	
n-Octacosane (S)	66	%	50-150	1	10/03/11 13:05	10/03/11 18:27	630-02-4	
o-Terphenyl (S)	59	%	50-150	1	10/03/11 13:05	10/03/11 18:27	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND	mg/L	0.019	1	10/03/11 13:05	10/04/11 00:33		
Motor Oil Range SG	ND	mg/L	0.095	1	10/03/11 13:05	10/04/11 00:33	64742-65-0	
n-Octacosane (S) SG	69	%	50-150	1	10/03/11 13:05	10/04/11 00:33	630-02-4	
o-Terphenyl (S) SG	61	%	50-150	1	10/03/11 13:05	10/04/11 00:33	84-15-1	

## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259314

<b>Sample: 5-W-170-0911</b>		<b>Lab ID: 259314007</b>	Collected: 09/21/11 13:55		Received: 09/22/11 08:40		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND mg/L		0.019	1	10/03/11 13:05	10/03/11 18:44		
Motor Oil Range	ND mg/L		0.095	1	10/03/11 13:05	10/03/11 18:44	64742-65-0	
n-Octacosane (S)	74 %		50-150	1	10/03/11 13:05	10/03/11 18:44	630-02-4	
o-Terphenyl (S)	75 %		50-150	1	10/03/11 13:05	10/03/11 18:44	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND mg/L		0.019	1	10/03/11 13:05	10/04/11 00:50		
Motor Oil Range SG	ND mg/L		0.095	1	10/03/11 13:05	10/04/11 00:50	64742-65-0	
n-Octacosane (S) SG	81 %		50-150	1	10/03/11 13:05	10/04/11 00:50	630-02-4	
o-Terphenyl (S) SG	79 %		50-150	1	10/03/11 13:05	10/04/11 00:50	84-15-1	

<b>Sample: 5-W-16-0911</b>		<b>Lab ID: 259314008</b>	Collected: 09/21/11 14:40		Received: 09/22/11 08:40		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND mg/L		0.019	1	10/03/11 13:05	10/03/11 19:01		
Motor Oil Range	ND mg/L		0.095	1	10/03/11 13:05	10/03/11 19:01	64742-65-0	
n-Octacosane (S)	69 %		50-150	1	10/03/11 13:05	10/03/11 19:01	630-02-4	
o-Terphenyl (S)	67 %		50-150	1	10/03/11 13:05	10/03/11 19:01	84-15-1	
<b>NWTPH-Dx GCS Silica Gel</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range SG	ND mg/L		0.019	1	10/03/11 13:05	10/04/11 01:07		
Motor Oil Range SG	ND mg/L		0.095	1	10/03/11 13:05	10/04/11 01:07	64742-65-0	
n-Octacosane (S) SG	70 %		50-150	1	10/03/11 13:05	10/04/11 01:07	630-02-4	
o-Terphenyl (S) SG	67 %		50-150	1	10/03/11 13:05	10/04/11 01:07	84-15-1	

<b>Sample: IA-W-4-0911</b>		<b>Lab ID: 259314009</b>	Collected: 09/21/11 15:35		Received: 09/22/11 08:40		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	ND mg/L		0.019	1	09/30/11 10:00	10/01/11 00:16		B-
Motor Oil Range	ND mg/L		0.095	1	09/30/11 10:00	10/01/11 00:16	64742-65-0	
n-Octacosane (S)	87 %		50-150	1	09/30/11 10:00	10/01/11 00:16	630-02-4	
o-Terphenyl (S)	84 %		50-150	1	09/30/11 10:00	10/01/11 00:16	84-15-1	

<b>Sample: 5-W-55-0911</b>		<b>Lab ID: 259314010</b>	Collected: 09/21/11 09:40		Received: 09/22/11 08:40		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>NWTPH-Dx GCS</b>		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510						
Diesel Range	0.26 mg/L		0.019	1	10/03/11 13:05	10/03/11 20:58		

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259314

Sample: 5-W-55-0911		Lab ID: 259314010		Collected: 09/21/11 09:40		Received: 09/22/11 08:40		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Motor Oil Range		0.24 mg/L		0.094	1	10/03/11 13:05	10/03/11 20:58	64742-65-0	
n-Octacosane (S)		71 %		50-150	1	10/03/11 13:05	10/03/11 20:58	630-02-4	
o-Terphenyl (S)		76 %		50-150	1	10/03/11 13:05	10/03/11 20:58	84-15-1	

Sample: 5-W-56-0911		Lab ID: 259314011		Collected: 09/21/11 10:30		Received: 09/22/11 08:40		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.95 mg/L		0.019	1	10/17/11 09:55	10/17/11 19:01		
Motor Oil Range		0.57 mg/L		0.094	1	10/17/11 09:55	10/17/11 19:01	64742-65-0	
n-Octacosane (S)		73 %		50-150	1	10/17/11 09:55	10/17/11 19:01	630-02-4	2n
o-Terphenyl (S)		67 %		50-150	1	10/17/11 09:55	10/17/11 19:01	84-15-1	

Sample: GW-2-0911		Lab ID: 259314012		Collected: 09/21/11 11:45		Received: 09/22/11 08:40		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		0.043	mg/L	0.019	1	10/17/11 09:55	10/17/11 19:34		
Motor Oil Range		ND	mg/L	0.094	1	10/17/11 09:55	10/17/11 19:34	64742-65-0	
n-Octacosane (S)		82	%	50-150	1	10/17/11 09:55	10/17/11 19:34	630-02-4	2n
o-Terphenyl (S)		75	%	50-150	1	10/17/11 09:55	10/17/11 19:34	84-15-1	

Sample: EW-2A-0911		Lab ID: 259314013		Collected: 09/21/11 12:40		Received: 09/22/11 08:40		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		ND mg/L		0.019	1	10/03/11 13:05	10/03/11 20:08		
Motor Oil Range		ND mg/L		0.094	1	10/03/11 13:05	10/03/11 20:08	64742-65-0	
n-Octacosane (S)		63 %		50-150	1	10/03/11 13:05	10/03/11 20:08	630-02-4	
o-Terphenyl (S)		68 %		50-150	1	10/03/11 13:05	10/03/11 20:08	84-15-1	

Sample: 5-W-51-0911		Lab ID: 259314014		Collected: 09/21/11 14:15		Received: 09/22/11 08:40		Matrix: Water	
Parameters		Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS		Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Range		2.1 mg/L		0.019	1	10/03/11 13:05	10/03/11 21:15		
Motor Oil Range		2.1 mg/L		0.094	1	10/03/11 13:05	10/03/11 21:15	64742-65-0	
n-Octacosane (S)		84 %		50-150	1	10/03/11 13:05	10/03/11 21:15	630-02-4	

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## ANALYTICAL RESULTS

Project: BNSF-Skykomish

Pace Project No.: 259314

<b>Sample: 5-W-51-0911</b>		<b>Lab ID: 259314014</b>	Collected: 09/21/11 14:15	Received: 09/22/11 08:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

o-Terphenyl (S)	87 %		50-150	1	10/03/11 13:05	10/03/11 21:15	84-15-1	
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<b>Sample: 5-W-54-0911</b>		<b>Lab ID: 259314015</b>	Collected: 09/21/11 15:10	Received: 09/22/11 08:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.020 mg/L		0.019	1	10/03/11 13:05	10/03/11 20:25		
Motor Oil Range	ND mg/L		0.094	1	10/03/11 13:05	10/03/11 20:25	64742-65-0	
n-Octacosane (S)	72 %		50-150	1	10/03/11 13:05	10/03/11 20:25	630-02-4	
o-Terphenyl (S)	74 %		50-150	1	10/03/11 13:05	10/03/11 20:25	84-15-1	

<b>Sample: MW-16-0911</b>		<b>Lab ID: 259314016</b>	Collected: 09/21/11 16:05	Received: 09/22/11 08:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	ND mg/L		0.019	1	10/03/11 13:05	10/03/11 20:42		
Motor Oil Range	ND mg/L		0.094	1	10/03/11 13:05	10/03/11 20:42	64742-65-0	
n-Octacosane (S)	69 %		50-150	1	10/03/11 13:05	10/03/11 20:42	630-02-4	
o-Terphenyl (S)	77 %		50-150	1	10/03/11 13:05	10/03/11 20:42	84-15-1	

<b>Sample: IB-W-23-0911</b>		<b>Lab ID: 259314017</b>	Collected: 09/21/11 17:05	Received: 09/22/11 08:40	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

### NWTPH-Dx GCS

Analytical Method: NWTPH-Dx Preparation Method: EPA 3510

Diesel Range	0.075 mg/L		0.019	1	10/03/11 13:05	10/03/11 22:05		
Motor Oil Range	0.21 mg/L		0.094	1	10/03/11 13:05	10/03/11 22:05	64742-65-0	
n-Octacosane (S)	65 %		50-150	1	10/03/11 13:05	10/03/11 22:05	630-02-4	
o-Terphenyl (S)	70 %		50-150	1	10/03/11 13:05	10/03/11 22:05	84-15-1	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 259314

QC Batch: OEXT/4440

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 259314002, 259314009

METHOD BLANK: 88090

Matrix: Water

Associated Lab Samples: 259314002, 259314009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	0.025	0.020	09/30/11 18:44	3n
Motor Oil Range	mg/L	ND	0.10	09/30/11 18:44	
n-Octacosane (S)	%	73	50-150	09/30/11 18:44	
o-Terphenyl (S)	%	75	50-150	09/30/11 18:44	

LABORATORY CONTROL SAMPLE: 88091

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1	0.69	69	51-147	
Motor Oil Range	mg/L	1	0.76	76	20-160	
n-Octacosane (S)	%			73	50-150	
o-Terphenyl (S)	%			77	50-150	

SAMPLE DUPLICATE: 88092

Parameter	Units	259311010 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND	0.022		B+
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	71	77	9	
o-Terphenyl (S)	%	71	74	5	

SAMPLE DUPLICATE: 88093

Parameter	Units	259314002 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	1.0	1.2	15	1n
Motor Oil Range	mg/L	0.50	0.63	23	
n-Octacosane (S)	%	69	74	7	
o-Terphenyl (S)	%	70	77	9	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 259314

QC Batch:	OEXT/4450	Analysis Method:	NWTPH-Dx
QC Batch Method:	EPA 3510	Analysis Description:	NWTPH-Dx GCS
Associated Lab Samples:	259314001, 259314003, 259314004, 259314005, 259314006, 259314007, 259314008, 259314010, 259314013, 259314014, 259314015, 259314016, 259314017		

METHOD BLANK: 88473 Matrix: Water

Associated Lab Samples: 259314001, 259314003, 259314004, 259314005, 259314006, 259314007, 259314008, 259314010, 259314013, 259314014, 259314015, 259314016, 259314017

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	10/03/11 16:47	
Motor Oil Range	mg/L	ND	0.10	10/03/11 16:47	
n-Octacosane (S)	%	77	50-150	10/03/11 16:47	
o-Terphenyl (S)	%	83	50-150	10/03/11 16:47	

LABORATORY CONTROL SAMPLE: 88474

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	1	0.70	70	51-147	
Motor Oil Range	mg/L	1	0.79	79	20-160	
n-Octacosane (S)	%			65	50-150	
o-Terphenyl (S)	%			78	50-150	

SAMPLE DUPLICATE: 88475

Parameter	Units	259314008 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	ND	.014J		
Motor Oil Range	mg/L	ND	ND		
n-Octacosane (S)	%	69	65	5	
o-Terphenyl (S)	%	67	63	6	

SAMPLE DUPLICATE: 88476

Parameter	Units	259314014 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	2.1	1.3	52	R1
Motor Oil Range	mg/L	2.1	1.3	48	
n-Octacosane (S)	%	84	60	33	
o-Terphenyl (S)	%	87	63	31	

## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 259314

QC Batch: OEXT/4551

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS

Associated Lab Samples: 259314011, 259314012

METHOD BLANK: 90548

Matrix: Water

Associated Lab Samples: 259314011, 259314012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range	mg/L	ND	0.020	10/17/11 18:28	
Motor Oil Range	mg/L	ND	0.10	10/17/11 18:28	
n-Octacosane (S)	%	81	50-150	10/17/11 18:28	
o-Terphenyl (S)	%	80	50-150	10/17/11 18:28	

LABORATORY CONTROL SAMPLE: 90549

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range	mg/L	4	2.8	70	51-147	
Motor Oil Range	mg/L	4	3.2	79	20-160	
n-Octacosane (S)	%			85	50-150	
o-Terphenyl (S)	%			81	50-150	

SAMPLE DUPLICATE: 90550

Parameter	Units	259314011 Result	Dup Result	RPD	Qualifiers
Diesel Range	mg/L	0.95	0.97	2	
Motor Oil Range	mg/L	0.57	0.59	4	
n-Octacosane (S)	%	73	85	16 2n	
o-Terphenyl (S)	%	67	77	14	



## QUALITY CONTROL DATA

Project: BNSF-Skykomish

Pace Project No.: 259314

QC Batch: OEXT/4451

Analysis Method: NWTPH-Dx

QC Batch Method: EPA 3510

Analysis Description: NWTPH-Dx GCS SG

Associated Lab Samples: 259314001, 259314003, 259314004, 259314005, 259314006, 259314007, 259314008

METHOD BLANK: 88477

Matrix: Water

Associated Lab Samples: 259314001, 259314003, 259314004, 259314005, 259314006, 259314007, 259314008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range SG	mg/L	ND	0.020	10/04/11 14:43	
Motor Oil Range SG	mg/L	ND	0.10	10/04/11 14:43	
n-Octacosane (S) SG	%	79	50-150	10/04/11 14:43	
o-Terphenyl (S) SG	%	89	50-150	10/04/11 14:43	

LABORATORY CONTROL SAMPLE: 88478

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Range SG	mg/L	1	0.75	75	51-147	
Motor Oil Range SG	mg/L	1	0.89	89	20-160	
n-Octacosane (S) SG	%			73	50-150	
o-Terphenyl (S) SG	%			84	50-150	

SAMPLE DUPLICATE: 88479

Parameter	Units	259314008 Result	Dup Result	RPD	Qualifiers
Diesel Range SG	mg/L	ND	ND		
Motor Oil Range SG	mg/L	ND	ND		
n-Octacosane (S) SG	%	70	72	4	
o-Terphenyl (S) SG	%	67	68	.7	

## QUALIFIERS

Project: BNSF-Skykomish

Pace Project No.: 259314

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel Clean-Up

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-S Pace Analytical Services - Seattle

### ANALYTE QUALIFIERS

- |    |   |
|----|---|
| 1n | Analyte result in the method blank is above the reporting limit (RL.) Sample acceptance is based upon each associated sample containing analyte results at least 10-times greater than that of the method blank, as per NELAC standard. |
| 2n | Sample analysis was scheduled outside recommended method holding time. Extraction proceeded per client request.   |
| 3n | The reported result for this analyte in the method blank is above the reporting limit.  |
| B+ | Analyte was detected in the associated method blank as well as in the sample.   |
| B- | Analyte detected in method blank but was not detected in the associated samples.  |
| R1 | RPD value was outside control limits.   |

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF-Skykomish

Pace Project No.: 259314

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
259314001	5-W-14-0911	EPA 3510	OEXT/4450	NWTPH-Dx	GCSV/2944
259314002	5-W-50-0911	EPA 3510	OEXT/4440	NWTPH-Dx	GCSV/2938
259314003	5-W-15-0911	EPA 3510	OEXT/4450	NWTPH-Dx	GCSV/2944
259314004	5-W-19-0911	EPA 3510	OEXT/4450	NWTPH-Dx	GCSV/2944
259314005	5-W-18-0911	EPA 3510	OEXT/4450	NWTPH-Dx	GCSV/2944
259314006	5-W-17-0911	EPA 3510	OEXT/4450	NWTPH-Dx	GCSV/2944
259314007	5-W-170-0911	EPA 3510	OEXT/4450	NWTPH-Dx	GCSV/2944
259314008	5-W-16-0911	EPA 3510	OEXT/4450	NWTPH-Dx	GCSV/2944
259314009	IA-W-4-0911	EPA 3510	OEXT/4440	NWTPH-Dx	GCSV/2938
259314010	5-W-55-0911	EPA 3510	OEXT/4450	NWTPH-Dx	GCSV/2944
259314011	5-W-56-0911	EPA 3510	OEXT/4551	NWTPH-Dx	GCSV/2997
259314012	GW-2-0911	EPA 3510	OEXT/4551	NWTPH-Dx	GCSV/2997
259314013	EW-2A-0911	EPA 3510	OEXT/4450	NWTPH-Dx	GCSV/2944
259314014	5-W-51-0911	EPA 3510	OEXT/4450	NWTPH-Dx	GCSV/2944
259314015	5-W-54-0911	EPA 3510	OEXT/4450	NWTPH-Dx	GCSV/2944
259314016	MW-16-0911	EPA 3510	OEXT/4450	NWTPH-Dx	GCSV/2944
259314017	IB-W-23-0911	EPA 3510	OEXT/4450	NWTPH-Dx	GCSV/2944
259314001	5-W-14-0911	EPA 3510	OEXT/4451	NWTPH-Dx	GCSV/2945
259314003	5-W-15-0911	EPA 3510	OEXT/4451	NWTPH-Dx	GCSV/2945
259314004	5-W-19-0911	EPA 3510	OEXT/4451	NWTPH-Dx	GCSV/2945
259314005	5-W-18-0911	EPA 3510	OEXT/4451	NWTPH-Dx	GCSV/2945
259314006	5-W-17-0911	EPA 3510	OEXT/4451	NWTPH-Dx	GCSV/2945
259314007	5-W-170-0911	EPA 3510	OEXT/4451	NWTPH-Dx	GCSV/2945
259314008	5-W-16-0911	EPA 3510	OEXT/4451	NWTPH-Dx	GCSV/2945



Environment

Submitted to:  
BNSF Skykomish

Submitted by:  
AECOM  
Pittsburgh PA  
60191113-0545  
December 2011

December 1, 2011

Organic  
Limited Data Validation Report

BNSF Skykomish  
Groundwater Samples  
Pace Analytical Services, Inc. Data  
October 2010 – September 2011

Prepared By Gregory A. Malzone  
Project Chemist

## **Overview**

The samples analyzed for the BNSF Skykomish groundwater sampling effort from October 2010 through September 2011 are listed in the Table of Samples Analyzed (pages 2-7). Limited data validation was performed on a total of one hundred ninety-five groundwater samples.

Samples were analyzed by Pace Analytical Services, Inc. of Seattle, WA (Pace-Seattle). The reviewed analysis was Diesel Range and Motor Oil Range Organics by WDOE method NWTPH-Dx (with and/or without Silica Gel Cleanup).

The Analytical Limited Data Validation Checklist is presented as pages 8-16. Data were evaluated based on validation criteria set forth in the *USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review*; document number USEPA-540-R-08-01, June 2008, 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 limited data validation procedure:

<b>Submitted Deliverables</b>
Case Narratives (including laboratory flags)
Chain-of-Custody form(s) and sample integrity
Sample results, reporting detection limits, dilution factors
Holding times
Method blank results
Organic surrogate recoveries
LCS, LCSD (blank spike, blank spike duplicate) recoveries
Laboratory duplicate RPDs
Field duplicate data (calculated RPDs)
Electronic data deliverable (EDD) query

## **Data Validation Qualifiers Assigned During this Review**

J: The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.

UJ: The analyte was analyzed for, but was not detected. The reported quantitation limit is approximated and may be inaccurate or imprecise.

Assigned qualifiers are detailed in the Analytical Limited Data Validation Checklist and are summarized in the Table of Qualified Analytical Results (page 17).

## **Overall Data Assessment**

Precision, accuracy, and method compliance have been determined to be acceptable, based on the data submitted. No data were missing, and no data points were rejected. All reported data are suitable for their intended use with the qualifications and clarifications noted.



**Table of Samples Analyzed  
BNSF Skykomish  
Groundwater Samples  
Pace Analytical (Pace-Seattle) Laboratory Reports (as listed)  
October 2010 - September 2011**

Matrix	Sample ID		Sample Date and Time		Lab SDG	Lab Sample ID
Groundwater	1C-W-1-1010	1C-W-8-1010 Dup	10/26/2010	10:55	255465	255465001
Groundwater	1C-W-8-1010		10/26/2010	11:40	252906	255465002
Groundwater	1C-W-80-1010		10/26/2010	12:20	252906	255465003
Groundwater	1C-W-7-1010		10/26/2010	12:45	252906	255465004
Groundwater	1C-W-1-1110	1C-W-8-1110 Dup	11/30/2010	11:55	255839	255839001
Groundwater	1C-W-8-1110		11/30/2010	12:40	255839	255839002
Groundwater	1C-W-80-1110		11/30/2010	13:00	255839	255839003
Groundwater	1C-W-7-1110		11/30/2010	14:15	255839	255839004
Groundwater	1C-W-7-1210	MW-3-1210 Dup	12/14/2010	14:20	256063	256063001
Groundwater	1C-W-1-1210		12/14/2010	14:15	256063	256063002
Groundwater	1C-W-8-1210		12/14/2010	14:45	256063	256063003
Groundwater	2B-W-4-1210		12/14/2010	15:25	256063	256063004
Groundwater	2A-W-40-1210		12/14/2010	16:20	256063	256063005
Groundwater	5-W-43-1210		12/14/2010	16:30	256063	256063006
Groundwater	2A-W-9-1210		12/15/2010	8:50	256063	256063007
Groundwater	2A-W-10-1210		12/15/2010	9:35	256063	256063008
Groundwater	MW-4-1210		12/15/2010	10:15	256063	256063009
Groundwater	MW-3-1210		12/15/2010	11:00	256063	256063010
Groundwater	MW-30-1210		12/15/2010	11:15	256063	256063011
Groundwater	GW-1-1210		12/15/2010	12:50	256063	256063012
Groundwater	2A-W-42-1210		12/15/2010	14:00	256063	256063013
Groundwater	5-W-20-1210		12/15/2010	14:35	256063	256063014
Groundwater	5-W-42-1210		12/15/2010	15:30	256063	256063015
Groundwater	5-W-18-1210		12/15/2010	16:10	256063	256063016
Groundwater	EW-1-1210		12/15/2010	9:35	256063	256063017
Groundwater	GW-2-1210		12/15/2010	11:15	256063	256063018
Groundwater	GW-20-1210		12/15/2010	10:15	256063	256063019
Groundwater	2A-W-41-1210		12/15/2010	13:00	256063	256063020
Groundwater	GW-3-1210	GW-2-1210 Dup	12/15/2010	13:55	256063	256063021
Groundwater	1B-W-23-1210		12/15/2010	15:20	256063	256063022
Groundwater	GW-4-1210		12/15/2010	16:15	256063	256063023
Groundwater	5-W-19-1210		12/16/2010	8:50	256063	256063024
Groundwater	5-W-16-1210	5-W-15-1210 Dup	12/16/2010	9:30	256063	256063025
Groundwater	5-W-14-1210		12/16/2010	9:45	256063	256063026
Groundwater	5-W-17-1210		12/16/2010	8:40	256063	256063027
Groundwater	5-W-15-1210		12/16/2010	10:35	256063	256063028
Groundwater	5-W-150-1210		12/16/2010	9:35	256063	256063029
Groundwater	1C-W-7-0111	1C-W-7-0111 Dup	1/26/2011	9:05	256372	256372001
Groundwater	1C-W-70-0111		1/26/2011	9:20	256372	256372002
Groundwater	1C-W-1-0111		1/26/2011	10:00	256372	256372003
Groundwater	1C-W-8-0111		1/26/2011	10:50	256372	256372004
Groundwater	1C-W-1-0211	1C-W-1-0211 Dup	2/21/2011	11:40	256702	256702001
Groundwater	1C-W-7-0211		2/21/2011	9:50	256702	256702002
Groundwater	1C-W-8-0211		2/21/2011	10:50	256702	256702003
Groundwater	1C-W-100-0211		2/21/2011	10:40	256702	256702004

**Table of Samples Analyzed  
BNSF Skykomish  
Groundwater Samples  
Pace Analytical (Pace-Seattle) Laboratory Reports (as listed)  
October 2010 - September 2011**

Matrix	Sample ID		Sample Date and Time		Lab SDG	Lab Sample ID
Groundwater	S1-AU-030111	S1-BU-030111 Dup	3/1/2011	11:40	256796	256796001
Groundwater	S1-AD-030111		3/1/2011	11:50	256796	256796002
Groundwater	S1-BU-030111		3/1/2011	12:15	256796	256796003
Groundwater	S10-BU-030111		3/1/2011	12:30	256796	256796004
Groundwater	S1-BD-030111		3/1/2011	12:20	256796	256796005
Groundwater	S2-AU-030111		3/1/2011	12:50	256796	256796006
Groundwater	S2-AD-030111		3/1/2011	12:55	256796	256796007
Groundwater	S2-BU-030111		3/1/2011	13:25	256796	256796008
Groundwater	S2-BD-030111		3/1/2011	13:30	256796	256796009
Groundwater	S3-AU-030111		3/1/2011	14:25	256796	256796010
Groundwater	S30-AU-030111	S3-AU-030111 Dup	3/1/2011	14:30	256796	256796011
Groundwater	S3-AD-030111		3/1/2011	14:35	256796	256796012
Groundwater	S3-BU-030111		3/1/2011	16:40	256796	256796013
Groundwater	S3-BD-030111		3/1/2011	16:50	256796	256796014
Groundwater	S3-CU-030111		3/1/2011	17:15	256796	256796015
Groundwater	S3-CD-030111		3/1/2011	17:10	256796	256796016
Groundwater	S4-AU-030111		3/1/2011	17:45	256796	256796017
Groundwater	S4-AD-030111		3/1/2011	17:50	256796	256796018
Groundwater	S4-BU-030111		3/1/2011	18:10	256796	256796019
Groundwater	S4-BD-030111		3/1/2011	18:15	256796	256796020
Groundwater	S4-CU-030111		3/1/2011	18:40	256796	256796021
Groundwater	S4-CD-030111		3/1/2011	18:45	256796	256796022
Groundwater	2B-W-4-0311	GW-3-0311 Dup	3/21/2011	9:30	257035	257035001
Groundwater	5-W-43-0311		3/21/2011	14:00	257035	257035002
Groundwater	GW-1-0311		3/21/2011	14:40	257035	257035003
Groundwater	GW-2-0311		3/21/2011	15:55	257035	257035004
Groundwater	MW-35R-0311		3/21/2011	15:15	257035	257035005
Groundwater	GW-3-0311		3/21/2011	16:40	257035	257035006
Groundwater	GW-30-0311		3/21/2011	16:55	257035	257035007
Groundwater	5-W-18-0311		3/21/2011	9:10	257035	257035008
Groundwater	5-W-19-0311		3/22/2011	9:50	257035	257035009
Groundwater	5-W-20-0311		3/22/2011	10:55	257035	257035010
Groundwater	5-W-42-0311	1C-W-17-0311 Dup	3/22/2011	11:35	257035	257035011
Groundwater	5-W-14-0311		3/22/2011	9:15	257035	257035012
Groundwater	5-W-15-0311		3/22/2011	11:20	257035	257035013
Groundwater	5-W-16-0311		3/22/2011	10:15	257035	257035014
Groundwater	1C-W-3-0311		3/22/2011	11:25	257035	257035015
Groundwater	1C-W-1-0311		3/22/2011	10:20	257035	257035016
Groundwater	1C-W-8-0311		3/22/2011	9:40	257035	257035017
Groundwater	1C-W-17-0311		3/22/2011	13:05	257035	257035018
Groundwater	1C-W-170-0311		3/22/2011	12:05	257035	257035019
Groundwater	5-W-50-0311		3/22/2011	13:15	257035	257035020
Groundwater	5-W-54-0311	5-W-54-0311 Dup	3/22/2011	14:35	257035	257035021
Groundwater	EW-1-0311		3/22/2011	14:10	257035	257035022
Groundwater	5-W-540-0311		3/22/2011	14:00	257035	257035023

**Table of Samples Analyzed**  
**BNSF Skykomish**  
**Groundwater Samples**  
**Pace Analytical (Pace-Seattle) Laboratory Reports (as listed)**  
**October 2010 - September 2011**

Matrix	Sample ID		Sample Date and Time		Lab SDG	Lab Sample ID
Groundwater	1C-W-4-0311	GW-16-0311 Dup	3/22/2011	13:30	257035	257035024
Groundwater	1C-W-7-0311		3/22/2011	14:35	257035	257035025
Groundwater	1B-W-3-0311		3/22/2011	15:35	257035	257035026
Groundwater	GW-16-0311		3/22/2011	16:15	257056	257056001
Groundwater	GW-160-0311		3/22/2011	16:30	257056	257056002
Groundwater	5-W-51-0311		3/22/2011	16:55	257056	257056003
Groundwater	1B-W-2-0311		3/22/2011	17:20	257056	257056004
Groundwater	2A-W-42-0311		3/22/2011	16:35	257056	257056005
Groundwater	5-W-55-0311		3/23/2011	10:05	257056	257056006
Groundwater	5-W-56-0311		3/23/2011	9:10	257056	257056007
Groundwater	2A-W-41-0311		3/23/2011	11:00	257056	257056008
Groundwater	GW-4-0311		3/23/2011	8:50	257056	257056009
Groundwater	MW-3-0311		3/23/2011	9:50	257056	257056010
Groundwater	MW-4-0311		3/23/2011	10:35	257056	257056011
Groundwater	2A-W-10-0311		3/23/2011	11:00	257056	257056012
Groundwater	2A-W-9-0311		3/23/2011	12:05	257056	257056013
Groundwater	1B-W-23-0311		3/23/2011	12:35	257056	257056014
Groundwater	1A-W-4-0311		3/23/2011	13:20	257056	257056015
Groundwater	2A-W-40-0311		3/23/2011	14:00	257056	257056016
Groundwater	2A-W-400-0311	2A-W-40-0311 Dup	3/23/2011	13:00	257056	257056017
Groundwater	1C-W-7-0411	1C-W-7-0411 Dup	4/27/2011	11:37	257465	257465001
Groundwater	1C-W-8-0411		4/27/2011	14:00	257465	257465002
Groundwater	1C-W-1-0411		4/27/2011	13:20	257465	257465003
Groundwater	1C-W-70-0411		4/27/2011	10:35	257465	257465004
Groundwater	1C-W-1-0511	1C-W-7-0511 Dup	5/19/2011	10:50	257749	257749001
Groundwater	1C-W-8-0511		5/19/2011	11:25	257749	257749002
Groundwater	1C-W-7-0511		5/19/2011	12:35	257749	257749003
Groundwater	1C-W-70-0511		5/19/2011	12:45	257749	257749004
Groundwater	S1-AU-0511	S2-BU-0511 Dup	5/27/2011	9:50	257895	257895001
Groundwater	S1-AD-0511		5/27/2011	9:55	257895	257895002
Groundwater	S1-BU-0511		5/27/2011	10:15	257895	257895003
Groundwater	S1-BD-0511		5/27/2011	10:20	257895	257895004
Groundwater	S2-AU-0511		5/27/2011	11:00	257895	257895005
Groundwater	S2-AD-0511		5/27/2011	11:10	257895	257895006
Groundwater	S2-BU-0511		5/27/2011	11:20	257895	257895007
Groundwater	S20-BU-0511		5/27/2011	11:25	257895	257895008
Groundwater	S2-BD-0511		5/27/2011	11:30	257895	257895009
Groundwater	S3-AU-0511		5/27/2011	11:55	257895	257895010
Groundwater	S3-AD-0511		5/27/2011	12:05	257895	257895011
Groundwater	S3-BU-0511		5/27/2011	12:15	257895	257895012
Groundwater	S3-BD-0511		5/27/2011	12:25	257895	257895013
Groundwater	S3-CU-0511		5/27/2011	12:40	257895	257895014
Groundwater	S30-CU-0511	S3-CU-0511 Dup	5/27/2011	12:45	257895	257895015
Groundwater	S3-CD-0511		5/27/2011	12:55	257895	257895016
Groundwater	S4-AU-0511		5/27/2011	13:20	257895	257895017

**Table of Samples Analyzed  
BNSF Skykomish  
Groundwater Samples  
Pace Analytical (Pace-Seattle) Laboratory Reports (as listed)  
October 2010 - September 2011**

Matrix	Sample ID		Sample Date and Time		Lab SDG	Lab Sample ID
Groundwater	S4-AD-0511		5/27/2011	13:10	257895	257895018
Groundwater	S4-BU-0511		5/27/2011	13:30	257895	257895019
Groundwater	S4-BD-0511		5/27/2011	13:35	257895	257895020
Groundwater	S4-CU-0511		5/27/2011	13:45	257895	257895021
Groundwater	S4-CD-0511		5/27/2011	13:50	257895	257895022
Groundwater	2B-W-4-0611		6/21/2011	12:25	258246	258246001
Groundwater	GW-1-0611		6/21/2011	13:20	258246	258246002
Groundwater	5-W-43-0611		6/21/2011	14:05	258246	258246003
Groundwater	GW-2-0611		6/21/2011	14:45	258246	258246004
Groundwater	GW-3-0611		6/21/2011	15:45	258246	258246005
Groundwater	2A-W-41-0611		6/21/2011	16:30	258246	258246006
Groundwater	2A-W-42-0611		6/21/2011	15:35	258246	258246007
Groundwater	GW-4-0611		6/21/2011	16:20	258246	258246008
Groundwater	EW-2A-0611		6/21/2011	17:10	258246	258246009
Groundwater	1C-W-1-0611		6/22/2011	9:15	258246	258246010
Groundwater	1C-W-7-0611		6/22/2011	10:50	258246	258246011
Groundwater	1C-W-8-0611		6/22/2011	9:55	258246	258246012
Groundwater	5-W-14-0611		6/22/2011	8:20	258246	258246013
Groundwater	5-W-17-0611		6/22/2011	10:00	258246	258246014
Groundwater	5-W-15-0611		6/22/2011	10:35	258246	258246015
Groundwater	5-W-150-0611	5-W-15-0611 Dup	6/22/2011	10:50	258246	258246016
Groundwater	5-W-19-0611		6/22/2011	12:35	258246	258246017
Groundwater	5-W-18-0611		6/22/2011	13:15	258246	258246018
Groundwater	5-W-16-0611		6/22/2011	13:50	258246	258246019
Groundwater	2A-W-9-0611		6/22/2011	15:05	258246	258246020
Groundwater	2A-W-10-0611		6/22/2011	15:25	258246	258246021
Groundwater	2A-W-100-0611	2A-W-10-0611 Dup	6/22/2011	15:40	258246	258246022
Groundwater	1B-W-23-0611		6/22/2011	12:00	258246	258246023
Groundwater	2A-W-40-0611		6/22/2011	14:00	258246	258246024
Groundwater	2A-W-400-0611	2A-W-40-0611 Dup	6/22/2011	14:30	258246	258246025
Groundwater	EW-1-0611		6/22/2011	15:05	258246	258246026
Groundwater	MW-3-0611		6/22/2011	16:00	258246	258246027
Groundwater	MW-4-0611		6/22/2011	16:00	258246	258246028
Groundwater	1C-W-1-0711		7/28/2011	13:40	258667	258667001
Groundwater	1C-W-7-0711		7/28/2011	11:35	258667	258667002
Groundwater	1C-W-8-0711		7/28/2011	12:40	258667	258667003
Groundwater	1C-W-80-0711	1C-W-8-0711 Dup	7/28/2011	13:00	258667	258667004
Groundwater	1C-W-1-0811		8/30/2011	12:45	259039	259039001
Groundwater	1C-W-7-0811		8/30/2011	14:25	259039	259039002
Groundwater	1C-W-80-0811	1C-W-8-0811 Dup	8/30/2011	14:00	259039	259039003
Groundwater	1C-W-8-0811		8/30/2011	13:25	259039	259039004
Groundwater	MW-4-0911		9/19/2011	10:05	259304	259304001
Groundwater	MW-40-0911	MW-4-0911 Dup	9/19/2011	8:45	259304	259304002
Groundwater	ZA-W-10-0911		9/19/2011	10:45	259304	259304003
Groundwater	ZA-W-09-0911		9/19/2011	11:15	259304	259304004

**Table of Samples Analyzed  
BNSF Skykomish  
Groundwater Samples  
Pace Analytical (Pace-Seattle) Laboratory Reports (as listed)  
October 2010 - September 2011**

Matrix	Sample ID		Sample Date and Time		Lab SDG	Lab Sample ID
Groundwater	ZA-W-4-0911	ZA-W-40-0911 Dup  GW-3-0911 Dup	9/19/2011	13:10	259304	259304005
Groundwater	MW-3-0911		9/19/2011	13:55	259304	259304006
Groundwater	5-W-43-0911		9/19/2011	14:50	259304	259304007
Groundwater	GW-1-0911		9/19/2011	15:45	259304	259304008
Groundwater	1C-W-1-0911		9/20/2011	10:20	259304	259304009
Groundwater	1C-W-8-0911		9/20/2011	11:10	259304	259304010
Groundwater	1C-W-3-0911		9/20/2011	12:00	259304	259304011
Groundwater	1C-W-4-0911		9/20/2011	14:40	259304	259304012
Groundwater	1C-W-7-0911		9/20/2011	15:35	259304	259304013
Groundwater	1B-W-2-0911		9/20/2011	16:35	259304	259304014
Groundwater	1B-W-3-0911		9/20/2011	17:50	259304	259304015
Groundwater	MW-36R-0911		9/20/2011	10:20	259304	259304016
Groundwater	EW-1-0911		9/20/2011	11:10	259304	259304017
Groundwater	ZA-W-41-0911		9/20/2011	12:10	259304	259304018
Groundwater	ZA-W-40-0911		9/20/2011	14:30	259304	259304019
Groundwater	ZA-W-400-0911		9/20/2011	13:30	259304	259304020
Groundwater	GW-3-0911		9/20/2011	15:40	259304	259304021
Groundwater	GW-30-0911		9/20/2011	14:40	259304	259304022
Groundwater	ZA-W-42-0911		9/20/2011	16:40	259304	259304023
Groundwater	GW-4-0911		9/20/2011	17:30	259304	259304024
Groundwater	S1-AU-0911	S3-AU-0911 Dup  S4-AU-0911 Dup	9/20/2011	15:20	259311	259311001
Groundwater	S1-AD-0911		9/20/2011	15:25	259311	259311002
Groundwater	S1-BU-0911		9/20/2011	15:30	259311	259311003
Groundwater	S1-BD-0911		9/20/2011	15:35	259311	259311004
Groundwater	S2-AU-0911		9/20/2011	16:00	259311	259311005
Groundwater	S2-AD-0911		9/20/2011	16:05	259311	259311006
Groundwater	S2-BU-0911		9/20/2011	16:20	259311	259311007
Groundwater	S2-BD-0911		9/20/2011	16:25	259311	259311008
Groundwater	S3-AU-0911		9/20/2011	16:40	259311	259311009
Groundwater	S30-AU-0911		9/20/2011	16:45	259311	259311010
Groundwater	S3-AD-0911		9/20/2011	17:10	259311	259311011
Groundwater	S3-BU-0911		9/20/2011	17:15	259311	259311012
Groundwater	S3-CU-0911		9/20/2011	17:35	259311	259311013
Groundwater	S3-CD-0911		9/20/2011	17:40	259311	259311014
Groundwater	S4-AU-0911		9/20/2011	18:10	259311	259311015
Groundwater	S40-AU-0911		9/20/2011	18:15	259311	259311016
Groundwater	S4-AD-0911		9/20/2011	18:20	259311	259311017
Groundwater	S4-BD-0911		9/20/2011	18:25	259311	259311018
Groundwater	S4-BU-0911		9/20/2011	18:30	259311	259311019
Groundwater	S4-CD-0911		9/20/2011	18:40	259311	259311020
Groundwater	S4-CU-0911		9/20/2011	18:45	259311	259311021
Groundwater	S3-BD-0911		9/20/2011	17:15	259311	259311022
Groundwater	5-W-14-0911		9/21/2011	9:10	259314	259314001
Groundwater	5-W-50-0911		9/21/2011	10:00	259314	259314002
Groundwater	5-W-15-0911		9/21/2011	10:30	259314	259314003



**Table of Samples Analyzed  
BNSF Skykomish  
Groundwater Samples  
Pace Analytical (Pace-Seattle) Laboratory Reports (as listed)  
October 2010 - September 2011**

Matrix	Sample ID		Sample Date and Time		Lab SDG	Lab Sample ID
Groundwater	5-W-19-0911	5-W-17-0911 Dup	9/21/2011	11:10	259314	259314004
Groundwater	5-W-18-0911		9/21/2011	11:45	259314	259314005
Groundwater	5-W-17-0911		9/21/2011	13:40	259314	259314006
Groundwater	5-W-170-0911		9/21/2011	13:55	259314	259314007
Groundwater	5-W-16-0911		9/21/2011	14:40	259314	259314008
Groundwater	1A-W-4-0911		9/21/2011	15:35	259314	259314009
Groundwater	5-W-55-0911		9/21/2011	9:40	259314	259314010
Groundwater	5-W-56-0911		9/21/2011	10:30	259314	259314011
Groundwater	GW-2-0911		9/21/2011	11:45	259314	259314012
Groundwater	EW-2A-0911		9/21/2011	12:40	259314	259314013
Groundwater	5-W-51-0911		9/21/2011	14:15	259314	259314014
Groundwater	5-W-54-0911		9/21/2011	15:10	259314	259314015
Groundwater	MW-16-0911		9/21/2011	16:05	259314	259314016
Groundwater	1B-W-23-0911		9/21/2011	17:05	259314	259314017

## ANALYTICAL LIMITED DATA VALIDATION CHECKLIST

Project Name: BNSF Skykomish	Laboratory: Pace Analytical Services, Inc. of Seattle, WA (Pace-Seattle)					
Project Reference: Groundwater Samples	Sample Matrix: Groundwater Samples					
AECOM Project: 60191113-0545	Sample Start Date: 10/26/2010					
Validator/Date Validated: Greg Malzone 12/01/2011 (completed)	Sample End Date: 09/21/2011					
Samples Analyzed: see Table of Samples Analyzed, BNSF Skykomish, Groundwater Samples, October 2010 - September 2011 (pages 2-7).						
Parameters Reviewed: Diesel Range and Motor Oil Range Organics by WDOE method NWTPH-Dx (with and/or without Silica Gel cleanup).						
Laboratory Project IDs (SDGs): 255465, 255839, 256063, 256372, 256702, 256796, 257035, 257056, 257465, 257149, 257895, 258246, 258667, 259039, 259304, 259311, 259314						
<b>PRECISION, ACCURACY, METHOD COMPLIANCE, AND COMPLETENESS ASSESSMENT</b>						
Precision:	<b>X</b>	Acceptable		Unacceptable	GAM	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-chart QC limits. Four data points required qualification based on lab duplicate RPDs (see item 17). Two data points required qualification based on field duplicate results (see item 21). Overall field and laboratory precision was acceptable because a majority of the data points were unqualified and no data points were rejected. Precision measurements are reviewed in items 17 and 21.						
Accuracy:	<b>X</b>	Acceptable		Unacceptable	GAM	Initials
Comments: Accuracy, a measure of the analytical bias, was determined by reviewing method blank results for evidence of contamination stemming from the analytical process. In addition, laboratory accuracy was measured by evaluating laboratory control sample, laboratory control sample duplicate (LCS, LCSD) and organic system monitoring compound (surrogate) percent recoveries (%Rs). LCS, LCSD %Rs demonstrated overall analytical performance. System monitoring compound or surrogate recoveries measured system performance and efficiency during organic analysis. The %Rs were compared to EPA published and/or laboratory control-chart QC limits. Some data required qualification based on method blank contamination (see item 11), surrogate recovery (see item 14), and LCS recovery (see item 15). Overall field and laboratory accuracy were acceptable because a majority of the data points were unqualified and no data were rejected. Accuracy measurements are reviewed in items 11, 12, 14, 15, 16, and 20.						
Method Compliance:	<b>X</b>	Acceptable		Unacceptable	GAM	Initials
Comments: For this data set, method compliance was determined by evaluating sample integrity, holding time, and reporting limits against method specified requirements. Four data points required qualifications because the holding time was exceeded (see item 8). Overall method compliance was acceptable based on the data submitted. Method compliance measurements are reviewed in items 4, 6, 8, 13, 18, 19, 20, and 22.						

## ANALYTICAL LIMITED DATA VALIDATION CHECKLIST

Completeness:	<b>X</b>	Acceptable		Unacceptable	GAM	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 limited data validation 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. All of the data received were useable, with some qualification. No data points were missing or rejected. Completeness of the data set was 100%.</p>						
<b>VALIDATION CRITERIA CHECK</b>						
<p>The following data qualifiers were used in this review:</p> <p>J: The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.</p> <p>UJ: The analyte was analyzed for, but was not detected. The reported quantitation limit is approximated and may be inaccurate or imprecise.</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><b>Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 17).</b></p>						
1. Did the laboratory identify any non-conformances related to the analytical results?		Yes	<b>X</b>	No	GAM	Initials
<p>Comments: Spike recoveries outside of QC limits were noted. Any assigned laboratory flags were reviewed during the limited validation procedure.</p> <p>Data qualification, if any, related to the comments and/or assigned laboratory data flags are discussed in the following sections.</p>						
2. Were sample Chain-of-Custody forms complete?	<b>X</b>	Yes		No	GAM	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 dates and times of sample receipt.</p>						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	<b>X</b>	Yes		No	GAM	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?	<b>X</b>	Yes		No	GAM	Initials
<p>Comments: All samples were received intact and in good condition with cooler temperatures of 0.2° C to 7.4° C as noted on the Sample Condition Upon Receipt Forms provided. Samples received at less than 2° C were determined to be in acceptable condition since sample containers were intact and samples themselves were not frozen. Samples received at greater than 6° C were determined to be in acceptable condition since samples were hand-delivered from the field, ice was noted as present in the coolers and cooling process had begun, no other preservation issues were noted, and samples were kept in cold storage &lt;=4° C upon receipt at the laboratory. No action is required other than to note these observations.</p>						

## ANALYTICAL LIMITED DATA VALIDATION CHECKLIST

5. Were the reported analytical methods in compliance with WP/QAPP, permit, or COC?	<b>X</b>	Yes		No	GAM	Initials
Comments: The reported method and clean up (as applicable) met the COC requests and is in compliance with the parameters requested and the sample matrix.						
6. Were detection limits in accordance with WP/QAPP, permit, or method?		Yes	<b>X</b>	No	GAM	Initials
Comments: The reporting limits (RLs) are achievable by the quoted method. Note that the laboratory did not report any analyte concentrations $\geq$ method detection limit (MDL) but $<$ practical quantitation limit/reporting limit (PQL/RL) for any data sets except the July 2011 samples (SDG 258667). The July 2011 samples were inadvertently submitted for the routine instead of the low level organic extraction method as required. In order to compensate, the data for samples 1C-W-1-0711, 1C-W-7-0711, 1C-W-8-0711, and 1C-W-80-0711 were reported to the MDLs to achieve the lowest detection limits possible. The PQLs are elevated for samples 1C-W-1-0711, 1C-W-7-0711, 1C-W-8-0711, and 1C-W-80-0711.						
7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	<b>X</b>	Yes		No	GAM	Initials
Comments: Only analytes applicable to the requested method were reported.						
8. Were all sample holding times met?		Yes	<b>X</b>	No	GAM	Initials
<p>Comments: The required holding time periods for chemically preserved groundwater samples was: 14 days from sample collection to extraction, and 40 days from extraction to analysis for NWTPH-Dx. The method-required sample extraction and analytical holding times were met for all samples with the following exceptions.</p> <p><b>SDG 259314:</b> NWTPH-Dx analysis was assigned to samples 5-W-56-0911 and GW-2-0911 per project manager request on 10/14/11. <b>The NWTPH-Dx analyses were performed 12 days beyond the 14-day holding time for chemically preserved aqueous samples. The positive and non-detect diesel range organics and motor oil range organics results for samples 5-W-56-0911 and GW-2-0911 were qualified "J" and "UJ," as estimates, because of low bias due to the holding time being exceeded.</b></p> <p><b>Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 17).</b></p>						
9. Were correct concentration units reported?	<b>X</b>	Yes		No	GAM	Initials
Comments: All results were reported as mg/L (ppm).						
10. Were the reporting requirements for flagged data met?	<b>X</b>	Yes		No	GAM	Initials
Comments: All assigned laboratory flags were reviewed and evaluated during the limited validation process. Data validation qualifiers supersede any assigned laboratory data flags.						
11. Were laboratory blank samples free of target analyte contamination?		Yes	<b>X</b>	No	GAM	Initials
<p>Comments: The method blank samples were free of target analyte contamination with the following exceptions.</p> <p><b>SDG 259304:</b> Diesel range organics were detected in method blank 87649 at a concentration of 0.024 mg/L. <b>The positive diesel range organics result for associated sample EW-1-0911 was greater than the reporting limit, but less than five times the method blank level and was qualified "U," as undetected, because of laboratory contamination.</b> Non-detect results were not qualified on this basis.</p>						

## ANALYTICAL LIMITED DATA VALIDATION CHECKLIST

Continued from Item 11 above.

**SDG 259314:** Diesel range organics were detected in method blank 88090 at a concentration of 0.024 mg/L. The positive diesel range organics result for associated sample 5-W-50-0911 was greater than five times the method blank level and did not require qualification.

**Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 17).**

12. Were trip blank, field blank, and/or equipment rinse blank samples free of target analyte contamination?	<b>NA</b>	Yes	<b>NA</b>	No	GAM	Initials
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Comments: No field, equipment, or trip blank samples were submitted/required for this data set.

13. Were instrument calibrations within method or data validation control limits?	<b>NA</b>	Yes	<b>NA</b>	No	GAM	Initials
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*Comments: Not applicable for this level of limited data validation – Instrument calibration data were not supplied in analytical laboratory reports and were therefore not included in this data review.*

14. Were surrogate recoveries within control limits?		Yes	<b>X</b>	No	GAM	Initials
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Comments: Reported surrogate %Rs for organic analyses were within laboratory control-charted QC limits for all project samples and associated QC samples, or met the following requirement, except as noted. Non-volatile surrogate recoveries affected by required sample dilution did not require qualification, because extraction/analytical efficiency was demonstrated in associated blank and LCS, LCSD, and surrogate %Rs.

**SDG 255839: The o-terphenyl surrogate recovery for sample 1C-W-1-1110 was low (50%) and less than the lower laboratory quality control limit. The diesel range organics and motor oil range organics results for sample 1C-W-1-1110 were qualified “J” and “UJ,” as estimates, possibly biased low, due to suspected matrix interference.**

**Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 17).**

15. Were laboratory control sample recoveries within control limits?		Yes	<b>X</b>	No	GAM	Initials
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Comments: Reported LCS, LCSD recoveries were within data validation QC limits (70-130% for organics) for all target analytes, and/or were within laboratory control-charted QC limits as allowed for organic methods with the following exception.

**SDG 255839: The LCS 51446 recovery for diesel range organics was low (40%) and less than the lower laboratory quality control limit. The positive diesel range result for associated sample 1C-W-1-1110 was qualified “J,” as an estimated concentration, because of low method bias.**

**Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 17).**

16. Were matrix spike recoveries within control limits?	<b>NA</b>	Yes	<b>NA</b>	No	GAM	Initials
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Comments: MS/MSD quality control checks were not prepared and analyzed for this project. Sample duplicate and LCS QC checks were analyzed to evaluate accuracy and precision.



## ANALYTICAL LIMITED DATA VALIDATION CHECKLIST

17. Were all duplicate RPDs within control limits?		Yes	<b>X</b>	No	GAM	Initials
<p>Comments: Laboratory RPDs for target analytes in LCS/LCSD and project-specific laboratory replicate samples were within laboratory QC limits of 50% with the following exceptions.</p> <p><b>SDG 256796:</b> The RPD between the original and replicate analysis for sample S4-AD-030111 was greater than the maximum quality control limit (76%) for diesel range organics. <b>The positive diesel range result for sample S4-AD-030111 was qualified "J," as an estimated concentration, because of method imprecision and/or sample heterogeneity.</b></p> <p><b>SDG 257895:</b> The RPD between the original and replicate analysis for sample S4-CU-0511 was greater than the maximum quality control limit (101%) for diesel range organics. <b>The positive diesel range result for sample S4-CU-0511 was qualified "J," as an estimated concentration, because of method imprecision and/or sample heterogeneity.</b></p> <p><b>SDG 257895:</b> The diesel range result for sample S3-AD-0511 was non-detect at the reporting limit. The laboratory duplicate was positive and greater than the reporting limit. <b>The RPD could not be calculated. The non-detect diesel range result for sample S3-AD-0511 was qualified "UJ," as an estimate, because of method imprecision and/or sample heterogeneity.</b></p> <p><b>SDG 259314:</b> The RPD between the original and replicate analysis for sample 5-W-51-0911 was greater than the maximum quality control limit (52%) for diesel range organics. <b>The positive diesel range result for sample 5-W-51-0911 was qualified "J," as an estimated concentration, because of method imprecision and/or sample heterogeneity.</b></p> <p><b>Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 17).</b></p>						
18. Were organic system performance criteria met?	<b>NA</b>	Yes	<b>NA</b>	No	GAM	Initials
<p><i>Comments: Not applicable for this level of limited data validation – Organic system performance data were not supplied in analytical laboratory reports and were therefore not included in this data review.</i></p>						
19. Were internal standards within method criteria for GC/MS sample analyses?	<b>NA</b>	Yes	<b>NA</b>	No	GAM	Initials
<p><i>Comments: Not applicable for this level of limited data validation or for the analytical method reported.</i></p>						
20. Were inorganic system performance criteria met?	<b>NA</b>	Yes	<b>NA</b>	No	GAM	Initials
<p><i>Comments: Not applicable for this level of limited data validation or for the analytical method reported.</i></p>						

## ANALYTICAL LIMITED DATA VALIDATION CHECKLIST

21. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.		<b>X</b>	Yes		No	GAM	Initials
Duplicate Sample No.	IC-W-80-1010	Primary Sample No.		IC-W-8-1010			
Duplicate Sample No.	IC-W-80-1110	Primary Sample No.		IC-W-8-1110			
Duplicate Sample No.	MW-30-1210	Primary Sample No.		MW-3-1210			
Duplicate Sample No.	GW-20-1210	Primary Sample No.		GW-2-1210			
Duplicate Sample No.	5-W-150-1210	Primary Sample No.		5-W-15-1210			
Duplicate Sample No.	1C-W-70-0111	Primary Sample No.		1C-W-7-0111			
Duplicate Sample No.	1C-W-100-0211	Primary Sample No.		1C-W-1-0211			
Duplicate Sample No.	S10-BU-030111	Primary Sample No.		S1-BU-030111			
Duplicate Sample No.	S30-AU-030111	Primary Sample No.		S3-AU-030111			
Duplicate Sample No.	GW-30-0311	Primary Sample No.		GW-3-0311			
Duplicate Sample No.	1C-W-170-0311	Primary Sample No.		1C-W-17-0311			
Duplicate Sample No.	5-W-540-0311	Primary Sample No.		5-W-54-0311			
Duplicate Sample No.	GW-160-0311	Primary Sample No.		GW-16-0311			
Duplicate Sample No.	2A-W-400-0311	Primary Sample No.		2A-W-40-0311			
Duplicate Sample No.	1C-W-70-0411	Primary Sample No.		1C-W-7-0411			
Duplicate Sample No.	1C-W-70-0511	Primary Sample No.		1C-W-7-0511			
Duplicate Sample No.	S20-BU-0511	Primary Sample No.		S2-BU-0511			
Duplicate Sample No.	S30-CU-0511	Primary Sample No.		S3-CU-0511			
Duplicate Sample No.	5-W-150-0611	Primary Sample No.		5-W-15-0611			
Duplicate Sample No.	2A-W-100-0611	Primary Sample No.		2A-W-10-0611			
Duplicate Sample No.	2A-W-400-0611	Primary Sample No.		2A-W-40-0611			
Duplicate Sample No.	1C-W-80-0711	Primary Sample No.		1C-W-8-0711			
Duplicate Sample No.	1C-W-80-0811	Primary Sample No.		1C-W-8-0811			
Duplicate Sample No.	MW-40-0911	Primary Sample No.		MW-4-0911			
Duplicate Sample No.	ZA-W-400-0911	Primary Sample No.		ZA-W-40-0911			
Duplicate Sample No.	GW-30-0911	Primary Sample No.		GW-3-0911			
Duplicate Sample No.	S40-AU-0911	Primary Sample No.		S4-AU-0911			
Duplicate Sample No.	5-W-170-0911	Primary Sample No.		5-W-17-0911			
<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 <math>\pm</math> the reporting limit or were non-detect in both samples with one exception. <b>Qualifications (i.e., "J/UJ") were required for the diesel range organics results for samples S3-AU-030111 and S30-AU-030111 because of laboratory/field sampling imprecision and/or sample heterogeneity.</b></p>							

## ANALYTICAL LIMITED DATA VALIDATION CHECKLIST

The following RPDs were calculated:

SDG	Method	Units	Analyte	1C-W-8-1010	1C-W-80-1010	RPD	Qualifiers
255465	NWTPH-Dx	mg/L	Diesel Range	2.2	2.1	5	
255465	NWTPH-Dx	mg/L	Motor Oil Range	0.84	0.83	1	
SDG	Method	Units	Analyte	1C-W-8-1110	1C-W-80-1110	RPD	Qualifiers
255839	NWTPH-Dx	mg/L	Diesel Range	0.28	0.26	7	
255839	NWTPH-Dx	mg/L	Motor Oil Range	0.13	0.14	7	
SDG	Method	Units	Analyte	MW-3-1210	MW-30-1210	RPD	Qualifiers
256063	NWTPH-Dx	mg/L	Diesel Range	0.049	0.057	15	
SDG	Method	Units	Analyte	GW-2-1210	GW-20-1210	RPD	Qualifiers
256063	NWTPH-Dx	mg/L	Diesel Range	0.045	0.049	9	
SDG	Method	Units	Analyte	5-W-15-1210	5-W-150-1210	RPD	Qualifiers
256063	NWTPH-Dx	mg/L	Diesel Range	0.49	0.47	4	
256063	NWTPH-Dx	mg/L	Diesel Range SG	0.065	0.059	10	
256063	NWTPH-Dx	mg/L	Motor Oil Range	0.34	0.35	3	
SDG	Method	Units	Analyte	1C-W-7-0111	1C-W-70-0111	RPD	Qualifiers
256372	NWTPH-Dx	mg/L	Diesel Range	0.082	0.067	20	
SDG	Method	Units	Analyte	1C-W-1-0211	1C-W-100-0211	RPD	Qualifiers
256702	NWTPH-Dx	mg/L	Diesel Range	0.069	0.076	10	
SDG	Method	Units	Analyte	S1-BU-030111	S10-BU-030111	RPD	Qualifiers
256796	All results were non-detect.						
SDG	Method	Units	Analyte	S3-AU-030111	S30-AU-030111	RPD	Qualifiers
<b>256796</b>	<b>NWTPH-Dx</b>	<b>mg/L</b>	<b>Diesel Range</b>	<b>0.027</b>	<b>0.019 U</b>	<b>NC</b>	<b>J/UJ</b>
SDG	Method	Units	Analyte	GW-3-0311	GW-30-0311	RPD	Qualifiers
257035	NWTPH-Dx	mg/L	Diesel Range	0.030	0.027	11	
SDG	Method	Units	Analyte	5-W-17-0311	5-W-170-0311	RPD	Qualifiers
257035	All results were non-detect.						
SDG	Method	Units	Analyte	5-W-54-0311	5-W-540-0311	RPD	Qualifiers
257035	NWTPH-Dx	mg/L	Diesel Range	0.023	0.024	4	
SDG	Method	Units	Analyte	MW-16-0311	MW-160-0311	RPD	Qualifiers
257056	All results were non-detect.						
SDG	Method	Units	Analyte	2A-W-40-0311	2A-W-400-0311	RPD	Qualifiers
257056	All results were non-detect.						
SDG	Method	Units	Analyte	1C-W-7-0411	1C-W-70-0411	RPD	Qualifiers
257465	NWTPH-Dx	mg/L	Diesel Range	0.060	0.070	15	
SDG	Method	Units	Analyte	1C-W-7-0511	1C-W-70-0511	RPD	Qualifiers
257749	NWTPH-Dx	mg/L	Diesel Range	0.086	0.072	18	
SDG	Method	Units	Analyte	S2-BU-0511	S20-BU-0511	RPD	Qualifiers
257895	NWTPH-Dx	mg/L	Diesel Range	0.039	0.030	26	
SDG	Method	Units	Analyte	S3-CU-0511	S30-CU-0511	RPD	Qualifiers
257895	All results were non-detect.						

Continued on next page

## ANALYTICAL LIMITED DATA VALIDATION CHECKLIST

The following RPDs were calculated:

SDG	Method	Units	Analyte	5-W-15-0611	5-W-150-0611	RPD	Qualifiers
258246	NWTPH-Dx	mg/L	Diesel Range	0.28	0.27	4	
258246	NWTPH-Dx	mg/L	Diesel Range SG	0.053	0.061	14	
258246	NWTPH-Dx	mg/L	Motor Oil Range	0.19	0.19	0	
SDG	Method	Units	Analyte	2A-W-10-0611	2A-W-100-0611	RPD	Qualifiers
258246	NWTPH-Dx	mg/L	Diesel Range	0.14	0.15	7	
258246	NWTPH-Dx	mg/L	Motor Oil Range	0.32	0.36	12	
SDG	Method	Units	Analyte	2A-W-40-0611	2A-W-400-0611	RPD	Qualifiers
258246	All results were non-detect.						
SDG	Method	Units	Analyte	1C-W-8-0711	1C-W-80-0711	RPD	Qualifiers
258667	NWTPH-Dx	mg/L	Diesel Range	0.14	0.16	13	
SDG	Method	Units	Analyte	1C-W-8-0811	1C-W-80-0811	RPD	Qualifiers
259039	NWTPH-Dx	mg/L	Diesel Range	0.14	0.12	15	
SDG	Method	Units	Analyte	MW-4-0911	MW-40-0911	RPD	Qualifiers
259304	NWTPH-Dx	mg/L	Diesel Range	0.025	0.025	0	
SDG	Method	Units	Analyte	ZA-W-40-0911	ZA-W-400-0911	RPD	Qualifiers
259304	All results were non-detect.						
SDG	Method	Units	Analyte	GW-3-0911	GW-30-0911	RPD	Qualifiers
259304	All results were non-detect.						
SDG	Method	Units	Analyte	S4-AU-0911	S40-AU-0911	RPD	Qualifiers
259311	All results were non-detect.						
SDG	Method	Units	Analyte	5-W-17-0911	5-W-170-0911	RPD	Qualifiers
259314	All results were non-detect.						

**Refer to the table of Qualified Analytical Results for a listing of the samples, analytes, and concentrations qualified (page 17).**

22. Were qualitative criteria for organic target analyte identification met?	<b>NA</b>	Yes	<b>NA</b>	No	GAM	Initials
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*Comments: Not applicable for this level of limited data validation – Chromatograms, library searches, and quantitation reports were not supplied in analytical laboratory reports and were therefore not included in this data review. No identification or quantitation outliers were noted by the laboratory.*

23. Were 100% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	<b>X</b>	Yes		No	GAM	Initials
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Comments: 100% EDD QA/QC of positive concentrations and RLs was done as part of this limited data validation procedure. The following changes were made to the EDD file during data validation:

The data validator corrected any significant figure discrepancies between hardcopy report and EDD entries. According to validation protocol, the hardcopy data report was accepted as the correct reference.

The AECOM Environment database manager was informed of all changes made to the EDD file via this Checklist. The EDD file, with corrections made and data validation qualifiers and reason codes added was returned to the database manager in Seattle, WA on 12/08/11.

## ANALYTICAL LIMITED DATA VALIDATION CHECKLIST

24. General Comments: Data were evaluated based on validation criteria set forth in the *USEPA CLP National Functional Guidelines for Superfund Organic Methods Data Review*, document number USEPA-540-R-08-01, June 2008, 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 17).**



**Table of Qualified Analytical Results**  
**BNSF Skykomish**  
**Groundwater Samples**  
**Pace Analytical (Pace-Seattle) Laboratory Reports (as listed)**  
**October 2010 - September 2011**

Sample ID	Lab ID	Method	Dilution	Analyte	Concentration	Qualifier	Reason Code
Qualified Reportable Data:							
1C-W-1-0110	255839001	NWTPH-Dx	1	Diesel Range	0.044 mg/L	J	LCS, SUR
1C-W-1-0110	255839001	NWTPH-Dx	1	Motor Oil Range	< 0.094 mg/L	UJ	SUR
S3-AU-030111	256796010	NWTPH-Dx	1	Diesel Range	0.027 mg/L	J	FD
S30-AU-030111	256796011	NWTPH-Dx	1	Diesel Range	< 0.019 mg/L	UJ	FD
S4-AD-030111	256796018	NWTPH-Dx	1	Diesel Range	0.062 mg/L	J	RPD
S3-AD-0511	257895011	NWTPH-Dx	1	Diesel Range	< 0.019 mg/L	UJ	RPD
S4-CU-0511	257895021	NWTPH-Dx	1	Diesel Range	0.021 mg/L	J	RPD
EW-1-0911	259304017	NWTPH-Dx	1	Diesel Range	0.024 mg/L	U	MB
5-W-56-0911	259314011	NWTPH-Dx	1	Diesel Range	0.95 mg/L	J	HT
5-W-56-0911	259314011	NWTPH-Dx	1	Motor Oil Range	0.57 mg/L	J	HT
GW-2-0911	259314012	NWTPH-Dx	1	Diesel Range	0.043 mg/L	J	HT
GW-2-0911	259314012	NWTPH-Dx	1	Motor Oil Range	< 0.094 mg/L	UJ	HT
5-W-51-0911	259314014	NWTPH-Dx	1	Diesel Range	2.1 mg/L	J	RPD

(1): Data Validation Qualifiers:

J: The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.

UJ: The analyte was analyzed for, but was not detected. The reported quantitation limit is approximated and may be inaccurate or imprecise.

(2): Reason Codes:

FD: Field duplicate RPD (or difference) exceeded the advisory limits.

HT: The method-specified holding time was exceeded.

MB: Contamination was detected in the method blank.

RPD: Lab duplicate RPD (or difference) exceeded the quality control limits.

SUR: Surrogate recovery was outside the quality control limits.