John Michael Lease
Cashmere, Washington

Supplemental Remedial Investigation Report

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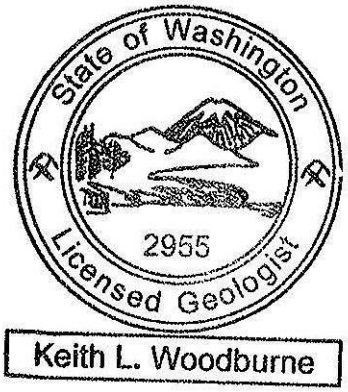

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ACRONYM LIST

AO	Agreed Order No. DE 15694
bgs	Below ground surface
BNSF	BNSF Railway Company
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
CAWP	Cleanup Action Work Plan
cPAHs	Carcinogenic polycyclic aromatic hydrocarbons
CUL	Cleanup level
COCs	Constituents of concern
CSM	Conceptual Site Model
DRO	Diesel-range organics
Ecology	Washington State Department of Ecology
EMR	EMR, Inc.
ft bgs	Feet below ground surface
GRO	Gasoline-range organics
LNAPL	Light non-aqueous phase liquid
mg/kg	Milligrams per kilogram
MTCA	Model Toxics Control Act
NFA	No Further Action
ORO	Oil-range organics
PCBs	Polychlorinated biphenyls
PQL	Practical quantitation limit
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
SGC	Silica gel cleanup
Site	John Michael Lease property
SOW	Scope of work
SPLP	Synthetic precipitation leaching procedure
TEE	Terrestrial Ecological Evaluation
TEF	Toxic Equivalency Factor
TOC	Total organic carbon
TPH	Total petroleum hydrocarbons
TRC	TRC Environmental
µg/L	Micrograms per liter
VCP	Voluntary Cleanup Program
WAC	Washington Administrative Code

Executive Summary

The John Michael Lease property consists of portions of the BNSF Railway Company (BNSF) right-of-way proximal to 5640 Sunset Highway in Cashmere, Washington. The property is the location of a reported historical train derailment and subsequent release of crude oil that occurred in the 1930s. The Wenatchee River is adjacent to the property to the east and flows southeast parallel to the BNSF rail line.

Environmental investigations conducted from 2004 through 2019 provided data that defined the nature and extent of soil and groundwater impacted with petroleum hydrocarbons and related compounds. Constituents of Concern (COCs) that were historically detected at concentrations exceeding Model Toxics Control Act (MTCA) Method A cleanup levels (CULs) include total petroleum hydrocarbons as diesel-range organics (DRO), oil-range organics (ORO), gasoline-range organics (GRO), carcinogenic polycyclic aromatic hydrocarbons (cPAHs), benzene, and naphthalenes. The lateral and vertical extent of these compounds at concentrations exceeding MTCA Method A CULs in impacted media define the MTCA Site within the property. No liquid-phase hydrocarbons have been observed in monitoring wells. In summary:

- Exceedances of COCs in soil are limited to five well-delineated areas of the property, four located on the southwest side of the tracks, and one located on the northeast side of the tracks.
- Most of the soil impacted areas with COC concentrations greater than MTCA Method A CULs are located deeper than 6 feet below ground surface (ft bgs), including the impacts in the area located on the northwest side of the tracks.
- Soils impacted with COCs do not leach those compounds to groundwater, as evidenced by the absence of groundwater impacts exceeding MTCA Method A CULs in all downgradient wells.
- Groundwater impacts are limited to occasional historical exceedances of the MTCA Method A CULs for DRO and ORO in a single well located on the southwest side of the tracks. Groundwater samples collected from wells on the northeast downgradient side of the tracks during the four quarters of 2019 were consistently non-detect for all COCs.
- No currently complete exposure pathways were identified in the evaluation of leaching of soil impacts to groundwater and discharge of groundwater to surface water pathways. Potentially complete exposure pathways exist for direct contract of impacted soil by construction workers and vapor intrusion in residential units if those were to be constructed on the property in the future.

The nature and extent of COCs in soil and groundwater have been defined and characterized throughout the property. Areas where COC concentrations exceed the applicable MTCA Method A CULs in soil or groundwater define the extent of the MTCA Site at the property. Based on the evidence compiled through investigations completed to date, there are currently no complete exposure pathways that could result in risks to human health or the environment from impacted soil or occasional groundwater CUL exceedances in one well located on the southwest side of the tracks. Residual soil and groundwater impacts will be managed via institutional controls through the filing of an environmental covenant on the deed for the property in accordance with Ecology guidance. In consideration of the currently incomplete exposure pathways to human health and the environment and their future management via institutional controls, a no further action (NFA) determination is requested for the Site pending filing of an approved environmental covenant.

1.0 Introduction

On behalf of BNSF, TRC Environmental (TRC) is providing this Remedial Investigation (RI) Report to the Washington State Department of Ecology (Ecology) pursuant to Agreed Order No. DE 15694 (AO) Scope of Work (SOW) for the BNSF John Michael Lease property (Site).

This RI Report has been prepared to summarize historical soil and groundwater investigations, define the nature and extent of contamination, and present a Conceptual Site Model (CSM). The CSM describes the current relationships between contaminant sources, release mechanisms, migration pathways, contaminant distribution, and potential receptors. The RI Report is based on the findings of environmental investigations completed through November 2019. Additional groundwater data was provided to Ecology on April 7, 2020 in the First Quarter 2020 Progress Report (TRC, 2020b). That progress report includes the first quarter 2020 groundwater monitoring results.

2.0 Site Description and Historical Operations

2.1 Site Description

The Site consists of the BNSF right-of-way proximal to the real property at 5640 Sunset Highway, at the northeast corner of the intersection of Hagman Road and Sunset Highway in Cashmere, Washington (Figure 1). A portion of the BNSF right-of-way is leased by Michael's Tires, a commercial business at 5640 Sunset Highway in Cashmere, Washington.

Per the Chelan County Assessor's Office (2020) website, the 0.34-acre leased property is identified as Parcel No. 231905120070. The Wenatchee River is adjacent to the east and flows parallel to the BNSF rail line to the southeast (Figure 2).

BNSF's predecessor railroad, the Great Northern Railway Company, operated at this location since 1892. A train derailment and subsequent release of crude oil from a tank car reportedly occurred at the property sometime in the 1930s (EMR, 2005). This information was verbally conveyed by residents during field activities in 2008 however, no formal records of the derailment have been located (Farallon, 2008). Based on this information, multiple subsurface investigations were initiated focusing on petroleum hydrocarbons and related constituents, specifically, diesel-range organics (DRO), oil-range organics (ORO), gasoline-range organics (GRO), benzene, toluene, ethylbenzene, and xylenes (BTEX), cPAHs, and naphthalenes.

2.2 Physical Setting and Geologic/Hydrogeologic Conditions

2.2.1 Regional Geologic/Hydrogeologic Conditions

The BNSF property is located within the Wenatchee River Valley, approximately 9 miles upstream of the confluence of the Wenatchee and Columbia Rivers. Local geology consists of quaternary sedimentary deposits and poorly developed soils deposited during the Wisconsin age. Previous work demonstrated the eastern portion of the property comprises fill material underlain by Pleistocene alluvial sediments deposited by the Wenatchee River; the western portion of the property comprises Pleistocene deposits of till, outwash, and glaciolacustrine material (Washington State Geological Survey, as cited in Farallon, 2016).

Outcrops of Tertiary bedrock are present on the north side of the Wenatchee River, observed in the river bed, and have been encountered beneath the property at shallow depths in several borings.

2.2.2 Geologic/Hydrogeologic Conditions

Soils encountered over multiple investigations primarily consist of sand and gravel with moderate to high permeability. Additionally, layers of silt, cobbles, debris, and organic material overlying bedrock were encountered. Four cross sections (two transverse cross sections: A-A' and B-B', and two longitudinal cross sections: C-C' and D-D') were developed to illustrate the stratigraphy and are provided as Figures 3 through 6. Soil boring logs from historical investigations are provided as Appendix A.

Water levels were measured in monitoring wells between 2008 and 2019 and are summarized in Table 1. Groundwater elevations were consistent from August 2008 to November 2019, with little seasonal variation in depth to water between events. Groundwater flow is generally to the east to northeast, toward the Wenatchee River. Figure 7 presents a representative groundwater elevation contour map, based on September 2019 data, which demonstrate typical groundwater elevation contours, gradients, and flow directions.

3.0 Investigation Chronology

This section summarizes the environmental investigation chronology, including previous investigations completed under Independent Action through 2010, the Voluntary Cleanup Program (VCP) through 2015, and subsequently under the AO.

- 2004 Release Discovery: Soil impacted with crude oil was encountered during the installation of utility poles along the west side of the tracks by an unidentified power company in December 2004 (EMR, 2005). The property was used for parking and storage of materials and vehicles. An engine block, drums containing unknown materials, and other miscellaneous debris were also observed at the property.

- 2005 Limited Phase II Assessment: The Limited Phase II Assessment was conducted in 2005 to investigate whether soil and groundwater were impacted. Constituents of potential concern (COPCs), primarily petroleum-related compounds identified as total petroleum hydrocarbons (TPH), including GRO, ORO, and DRO, were detected at concentrations exceeding Model Toxics Control Act (MTCA) Method A cleanup levels (CULs) in soil. Benzene, ORO, and DRO were detected at concentrations exceeding MTCA Method A CULs in reconnaissance groundwater samples (EMR, 2005).

- 2007 – 2008 Subsurface Investigations: Several subsurface investigations were conducted between September 2007 and July 2008 to further characterize nature and extent of impacts to soil and groundwater that were identified during the Limited Phase II Assessment (Farallon, 2009).

- 2009 Supplemental Subsurface Investigation: A supplemental subsurface investigation was conducted in April 2009 to further characterize the lateral extent of soil impacts in the vicinity of monitoring well MW-1 and in the area proximate to the southwest side of the rail line (Farallon, 2010).

- 2010 Remedial Alternatives Evaluation: An evaluation of cleanup alternatives was conducted based on the information collected during previous subsurface investigations and a Cleanup Action Work Plan (CAWP) was prepared and submitted to Ecology on August 19, 2010. The CAWP outlined proposed soil excavations on both the southwest and northeast side of the tracks to address the potential risks to human health and the environment (Farallon, 2010).

- November 2010 Correspondence: Ecology approved the CAWP in a response letter issued on November 15, 2010 and formally entered the Site into the VCP under VCP Project No. CE0278.

- 2012 Cultural Resources Survey and Supplemental Subsurface Investigation: A cultural resources survey was conducted concurrent with the supplemental subsurface investigation (TRC, 2012). The cultural resources survey was a condition of approval by the Chelan County Department of Community Development for the Shoreline Substantial Development, Shoreline Conditional Use, and Riparian Variance permits issued in anticipation of proposed remedial activities outlined in the CAWP (Farallon, 2010).

- 2012 – 2013 Groundwater Monitoring: Four quarterly groundwater monitoring events were conducted on September 25 and December 11, 2012; and March 20 and June 19, 2013 (TRC 2013a, 2013b). Results from these monitoring events demonstrated that COPCs in groundwater were either not detected or detected at concentrations less than MTCA Method A CULs and therefore, did not pose a risk to the Wenatchee River.

- March 2013 Ecology Meeting: Based on the 2012 through 2013 groundwater results, and following an on-site meeting between BNSF and Ecology on March 12, 2013, Ecology agreed via email correspondence (Ecology, 2013) that there may have been no risk to human health or the environment from residual soil impacts on the northeast side of the tracks, between the rail line and the Wenatchee River, and that removal of soil impacts on the northeast side of the tracks by excavation and offsite disposal as described in the 2010 CAWP might not be appropriate due to the potential for mobilization of COPCs or undermining of Wenatchee River shoreline bank stability resulting from excavation activities.

- December 2013 Revised CAWP: A Revised CAWP was prepared and submitted to Ecology on December 31, 2013 (TRC, 2013). The revised scope of the excavation outlined in the 2013 Revised CAWP was significantly reduced, based on the March 2013 on-site meeting with Ecology, and involved only the removal of vadose zone soils on the southwest side of the tracks, focused on impacts located at depths of between 0 and 6 feet bgs. Ecology approved the Revised CAWP on April 3, 2014.

- August 2014 Meeting with Ecology: On August 27, 2014, BNSF and Ecology held a meeting in the Yakima Ecology office at the request of BNSF to discuss path forward and necessity to implement the approved remedy outlined in the 2013 Revised CAWP. In lieu of the soil removal proposed in the 2013 Revised CAWP, BNSF recommended no removal or disturbance of impacted soils and proposed to manage areas containing residual impacted soils using institutional controls within an environmental covenant.

BNSF would also eliminate the direct exposure pathway for soils on the southwest side of the tracks and continue groundwater monitoring for one year.

Ecology was receptive to the recommendation but requested additional assessment of soil to groundwater leachability and targeted sampling for polychlorinated biphenyls (PCBs) in soil. The request for PCB analyses was based on raised practical quantitation limits (PQLs) for PCB data from a prior investigation, in which the non-detect values were greater than the MTCA Method A CUL due to matrix interferences and necessary sample dilutions at the laboratory. These results presented a data gap regarding the presence or absence of PCBs in soil.

- August 2015 Supplemental Soil and Groundwater Investigation: A Supplemental Soil and Groundwater Investigation was conducted to address Ecology prior concerns following the August 2014 meeting regarding PCBs in soil and leachability of residual petroleum hydrocarbon impacts in soil to groundwater. Soil samples collected from former trench locations T4-N, T6-N, and T7-S were non-detect for PCBs at the laboratory PQLs, which were less than the MTCA Method A CUL. As a result of those non-detections, PCBs are not considered a COC.

  Potential leachability of COPCs to groundwater was characterized during the 2015 investigation. However, the results of the leachability tests were determined to be overly conservative, not directly comparable to MTCA Method A groundwater CULs, and considered not representative of actual soil to groundwater leaching conditions.

  Based on the weight of evidence compiled through soil and groundwater monitoring investigations completed through 2015, including the information presented in the 2015 Supplemental Soil and Groundwater Investigation Report (TRC, 2016), BNSF requested that an NFA determination be issued by Ecology and recommended that residual COCs in soil be managed by institutional controls under an environmental covenant.

- September 2016 Correspondence: In a September 19, 2016 email correspondence, BNSF was directed by Ecology to prepare a draft environmental covenant for review and approval in advance of a pending NFA determination (Ecology, 2016a). BNSF completed the Site survey and submitted the requested draft environmental covenant to Ecology in support of Ecology's pending NFA determination.

- August 2017 Correspondence: An August 18, 2017 email from Ecology indicated an NFA determination was not warranted and that further action would be required (Ecology, 2017a). BNSF submitted a response to the August 18, 2017 Ecology letter on September 26, 2017 (TRC, 2017). However, Ecology responded in an October 26, 2017 correspondence (Ecology, 2017a) indicating BNSF would receive an Invitation to Negotiate Letter and a draft Agreed Order.

- October 2017 Correspondence: In an October 30, 2017 letter to BNSF Ecology formally terminated the VCP Agreement (Ecology, 2017b).

- May 2018 Correspondence: Following negotiations between BNSF and Ecology on scope of work and schedule, Ecology issued Final AO No. DE 15694 on May 22, 2018, with an effective date of May 24, 2018 (Ecology, 2018).

- 2018 – 2019 Supplemental Groundwater Data Collection: Tasks 1 and 2 of the AO included supplemental quarterly groundwater data collection and a data gap analysis. Two wells, MW-5 and MW-6, were installed at accessible areas on the northeast (river) side of the tracks at locations hydraulically downgradient of impacted soil present on the northeast side of the tracks. One well, MW-7, was installed at the edge of an area with historically identified impacted soil on the southwest side of the tracks.

  Six groundwater monitoring events have been conducted under the AO to support the requirement under Task 2 to characterize potential groundwater data gaps. The six monitoring events were conducted in November 2018 and March, June, September, and November 2019, and March 2020 (TRC 2019a, 2019b, 2019c, 2020a, and 2020b).

4.0 Conceptual Site Model

4.1 Release Information

The source of petroleum-related hydrocarbons in soil and groundwater reportedly originated from a derailment and subsequent release of crude oil from a compromised tank car that reportedly occurred in the 1930s (EMR, 2005). The derailment was verbally communicated by residents to staff during field activities (Farallon, 2008).

The COPCs are DRO, ORO, and GRO, cPAHs, benzene, and naphthalenes. These COPCs were detected at concentrations exceeding MTCA Method A CULs in soil and as dissolved phase in groundwater as summarized below. Light non-aqueous phase liquid (LNAPL) has not been observed in monitoring wells at the property.

4.2 Nature and Extent of Contamination

Subsurface soil and shallow groundwater are the only two media impacted by COPCs. The nature and extent of COPCs occurrence in these media are presented in the following sections.

4.2.1 Soil

Soil investigations conducted between 2004 and 2018 included the installation of 41 test pits (TP1 to TP41), 8 soil trenches (T1 to T8), 13 soil borings (B-1 to B-8 and FB-1 to FB-5), and 7 soil borings for installation of groundwater monitoring wells (MW-1 to MW-7). Analytical data for soil samples are presented in Tables 2 through 7.

These investigations identified the presence of COPCs in soil at concentrations greater than MTCA Method A CULs in five general areas, primarily at depths between 4 and 10 feet bgs. (Tables 2 and 3, Figure 8).

The potential presence of PCBs and RCRA 8 metals in soil was also evaluated during the 2009 investigation. PCBs were not detected in soil (Table 4) and are therefore not considered a COPC for soil. RCRA 8 metals were not detected at concentrations above the MTCA Method A CULs for soil (Table 5).

Potential leachability of COPCs in soil to groundwater was evaluated in 2015 using the Synthetic Precipitation Leaching Procedure (SPLP) method to extract a simulated leachate from soil samples collected from borings FB-1 to FB-5 where previous investigations indicated the

highest concentrations of COPCs were present (Tables 6 and 7). The SPLP data were refuted by the empirical data from groundwater samples collected in the immediate vicinity of the soil samples collected for the SPLP evaluation. Groundwater samples from those areas had COPCs that were non-detect or at concentrations less than MTCA Method A CULs over the previous 3 years. Therefore, the results of the SPLP method were determined to be overly conservative, not directly comparable to MTCA Method A groundwater CULs, and not representative of actual soil to groundwater leaching conditions.

The distribution of soil impacts based on COPC exceedances is shown on Figure 8. Four of the areas are between Sunset Highway and the railroad track, and one area is between the railroad track and the Wenatchee River (Figure 8). The northernmost impacted areas on the southwest side of the railroad tracks is centered around soil sample locations B5 and T5-SW, and is limited to cPAHs and GRO exceedances only, both samples were obtained from 8 ft bgs. The southernmost impacted areas on the southwest side of the tracks is centered around test pits TP15 (4 to 6 ft bgs), T8NE (6 ft bgs), and TP14 (6 to 8 ft bgs) and is limited to cPAHs exceedances only. The largest area of soil impacts on the southwest side of the railroad track is centered around monitoring well MW-7 and has exceedances of DRO, ORO, GRO, cPAHs, benzene, and naphthalenes. Benzene exceedances in this area are limited to a small sub-area centered around test pits TP10 (6 to 8 ft bgs) and TP12 (4 to 6 and 6 to 8 ft bgs). The remaining area of soil impact on the southwest side of the tracks is centered around trench T2-NE (8 ft bgs) and test pit TP9 (6 to 8 ft bgs).

There is one area of soil impact on the northeast side of the tracks centered around monitoring wells MW-1 and MW-5. The area has a combination of DRO, ORO, GRO, cPAHs, and naphthalenes exceedances.

As illustrated by the cross sections (Figures 3 through 6) and evidenced by the analytical results, the greatest volume of impacted soil is deeper than 6 ft bgs. However, some soil impacts on the southwest side of the tracks, in an area developed with a commercial tire repair shop, are present at depths shallower than 6 ft bgs. Soil impacts in the four areas on the southwest side of the tracks, between Sunset Highway and the railroad tracks, are primarily at depths of between 4 ft bgs to 10 ft bgs. The shallow soil impacts on the southwest side of the tracks at depths shallower than 6 ft bgs were the focus of excavations proposed in the Revised CAWP.

Soil impacts on the northeast side of the tracks, in the area between the tracks and the Wenatchee River, are at depths of between 8 and 18 ft bgs.

Petroleum hydrocarbons are less dense than water; therefore, petroleum in soil would not extend deeper than the top of the water table and smear zones caused by seasonal groundwater fluctuations, which are less than approximately 3 feet based on depth to water measurements in Table 1. In addition, subsurface soil is underlain by shallow, relatively impermeable bedrock, encountered in four borings at depths ranging from 12 to 17 ft bgs (Figures 3 through 6). The presence of the shallow, relatively impermeable bedrock further limits the potential downward migration of petroleum hydrocarbon impacts to soil.

4.2.2 Groundwater

Evaluations of historical groundwater data have identified GRO, DRO, ORO, BTEX, cPAHs, and naphthalenes as COPCs for groundwater. These COPCs were routinely analyzed to further

characterize the nature and extent of groundwater impacts at the property. Groundwater elevation data are summarized in Table 1, groundwater analytical results are summarized in Tables 8 and 9, and groundwater geochemical parameters measured during well purging are summarized in Table 10.

Seven monitoring wells have been installed since 2008 (Figure 7). Monitoring wells MW-1 through MW-4 were installed during the 2008 subsurface investigation to further characterize the nature and extent of COPCs in groundwater identified during the 2004 Limited Phase II Assessment (Farallon, 2009). Monitoring wells MW-5 through MW-7 were installed in 2018 as part of supplemental groundwater data collection activities required under Task 1 of the 2018 AO. MW-5 and MW-6 were installed on the northeast (river) side of the tracks at locations hydraulically downgradient of areas of soil impacts present on the southwest side of the tracks. MW-7 was installed at the downgradient edge of an area of documented soil impacts on the southwest side of the tracks.

Following an initial round of reconnaissance groundwater sampling collected from temporary wells installed during the 2004 investigation, permanent monitoring wells were installed and a total of 11 groundwater monitoring events have been conducted using the permanent wells between 2008 and 2019. One reconnaissance groundwater sample from temporary well B-5 had a benzene detection at a concentration greater than its MTCA Method A CUL. However, benzene has not been detected since. Analytical results from the most recent groundwater monitoring events conducted in 2019 are illustrated on Figure 7.

To be consistent with current draft Ecology guidance[1], DRO and ORO analysis was conducted with and without silica gel cleanup (SGC) during the 2018 – 2019 supplemental groundwater data collection. SGC is a laboratory sample preparation procedure used to minimize potential interferences from polar organic compounds that would incorrectly be quantified as petroleum hydrocarbons based on analysis by gas chromatography, resulting in false positives. Total organic carbon (TOC) analysis was added to quantify and characterize the amount of organic material that may contribute to elevated DRO and ORO concentrations for samples analyzed without SGC.

COPC concentrations for samples collected during the 11 monitoring events were below the MTCA Method A CULs, with the following exceptions in samples collected at wells MW-1 and MW-7:

- MW-1 August 2008: DRO with SGC and cPAHs were detected at concentrations exceeding MTCA Method A CULs during the initial post-installation sample in August 2008.

  MW-1 November 2018: During supplemental groundwater data collection activities, DRO and ORO analyzed with and without SGC were detected at concentrations exceeding MTCA Method A CULs. Based on the results from the groundwater sampling conducted

[1] The most recent Ecology publication, *Guidance for Remediation of Petroleum Contaminated Sites* (Ecology, 2016b) specifies that groundwater samples should not be prepared with SGC unless "background samples indicate that naturally occurring organic matter is a significant component of the TPH being detected in the groundwater samples" because most groundwater "does not contain significant levels of naturally occurring organic matter." The potential for interferences from organic compounds to bias TPH results high is further addressed in a draft Frequently Asked Questions fact sheet (Ecology 2019a), which suggests analyzing duplicate groundwater samples with and with without SGC to characterize potential interferences. Ecology plans to address standardized water sample preparation by revising the TPH analytical method as early as July 2020 (Ecology 2019b).

to date, the November 2018 CUL exceedances for DRO and ORO from well MW-1 were determined to be anomalous due to high turbidity in the sample. Following redevelopment of well MW-1 in March 2019, subsequent samples from MW-1 were collected with lower turbidity and results were consistently non-detect or detected at concentrations below the MTCA Method A CULs. Therefore, results from the subsequent four quarterly monitoring events (March through November 2019) are considered representative of groundwater conditions.

- MW-7: Results from MW-7 in November 2018 (detections of DRO and ORO without SGC) and June 2019 (detections of DRO without SGC and ORO without SGC) were also detected at concentrations exceeding the MTCA Method A CUL. However, the November 2018 and June 2019 exceedances in MW-7 also correlate with elevated TOC results during those events.

The data demonstrate that groundwater impacts are limited to occasional exceedances of MTCA Method A CULs for DRO and ORO on the southwest side of the tracks. Groundwater samples collected from wells on the northeast (downgradient) side of the tracks have been consistently non-detect for COPCs during the four quarterly sampling events in 2019 and the first quarterly sampling event of 2020. Groundwater has been fully characterized and there are no groundwater data gaps remaining.

4.3 Contaminant Fate and Transport

The impacted media are limited to soil and, to a lesser extent, occasional historical exceedances in groundwater samples from wells MW-1 and MW-7 located on the northeast and southwest sides of the tracks, respectively. Groundwater samples from downgradient wells during four quarters of monitoring from November 2018 to September 2019 were non-detect for COPCs. In addition, groundwater samples from MW-1 and MW-7 collected in March 2020 were non-detect for COPCs.

The COPCs in soil are distributed from the release location(s) spreading along the top of the water table and smear zones that are restricted by the approximately 3 feet or less seasonal fluctuations in the water table elevation. Most soil impacts are at depths greater than 6 ft bgs, primarily at depths of between 8 and 18 ft bgs on the northeast side of the tracks. COPCs in soil are not leaching to groundwater, as demonstrated by the absence of groundwater impacts over 12 years of periodic groundwater monitoring. The lack of contaminant transport from groundwater to surface water is demonstrated by consistent non-detects for COPCs in groundwater samples from downgradient wells on the northeast side of the tracks over four consecutive quarters of monitoring in 2019. The fourth quarter 2018 results from downgradient well MW-1 exceeded the MTCA Method A CULs for DRO and ORO. However, following well re-development, those exceedances were never repeated over four consecutive quarters of sampling.

DRO and ORO were occasionally detected (i.e., fourth quarter 2018 and second quarter 2019 only) at concentrations greater than MTCA Method A CULs in well MW-7 on the southwest (upgradient) side of the tracks. However, as noted above, DRO, ORO, and other groundwater COPCs were consistently not detected in the November 2018 to September 2019 quarterly samples from downgradient wells MW-5 and MW-6, and in all samples from MW-1 following re-development, which empirically demonstrates limited migration of those constituents with no potential to discharge to surface water.

Petroleum hydrocarbon impacts are generally limited to the top of the groundwater table, the smear zone defined by seasonal groundwater fluctuations, and by relatively shallow impermeable bedrock underlying the property. As a result, the only impacted areas are defined as the five soil areas illustrated on Figure 8, and with depth ranges indicated in cross sections on Figures 3 through 6.

4.4 Potential Exposure Pathways and Receptors

Potential exposure pathways were evaluated to determine whether COPCs pose unacceptable risk to human health or the environment under the current land use. The potential exposure pathways for soil and groundwater are summarized in Figure 9. The exposure pathways associated with dermal contact and ingestion of soil by construction workers and inhalation of volatiles from impacted soil are potentially complete as summarized below and depicted on Figure 9. The remaining exposure pathways; groundwater ingestion, and direct exposure to surface water are incomplete (Figure 9).

- Direct Soil Exposure Pathway: There is a potential direct exposure pathway to construction workers from COPCs present in vadose-zone soils. If future construction work occurs where soil is excavated to depths exceeding approximately 5 ft bgs, it is possible that construction workers could encounter impacted soil, depending on the location and depth of the work. Potential exposure to impacted soils by construction workers will be managed via an institutional control as part of an environmental covenant.

- Potable Groundwater Ingestion Pathway: DRO and ORO have been occasionally detected at concentrations greater than MTCA Method A CULs in historical groundwater samples from two wells (MW-1 and MW-7), though not in the most recent sampling events completed from September 2019 through and November 2019. Ecology's Washington State Well Report Viewer was queried and after thorough review of the data, three domestic supply wells exist within a 0.25-mile radius of the site.
    1) Well Report ID 419065 is listed as a domestic water well installed in 2005 to a depth of 53 ft bgs and is located cross-gradient from the BNSF property on an adjacent property with the address of 5660 Sunset Highway.
    2) Well Report ID 626912 is listed as a domestic water well installed in 2009 to a depth of 58 ft bgs and is located approximately 500 feet to the northwest of the BNSF property (cross-gradient) at the address of 5988 Goodwin Road.
    3) Well Report ID 125028 is a domestic water well installed in 1980 to a depth of 50 ft bgs and is located on a property approximately 800 feet cross-gradient from the BNSF property.

    One municipal well (Well Report ID 133661), which was installed in 1980 to a depth of 82 ft bgs, is located approximately 0.26 miles cross-gradient.

    Because these wells are located cross-gradient, and dissolved phase DRO/ORO in groundwater is limited in occurrence and extent, the groundwater ingestion exposure pathway is incomplete. Shallow groundwater is not typically used for drinking water due to potential impacts from septic systems and other surface and near surface contaminant sources and the Ecology requirement for a minimum 18-foot surface seal for domestic water supply wells (Washington Administrative Code [WAC] 173-160-231

(1)(c)); therefore, the likelihood of potable use of shallow groundwater is significantly limited. Furthermore, elimination of any use of shallow groundwater at the Site will be addressed via institutional controls as part of an environmental covenant.

- Vapor Intrusion and Inhalation Pathway: Only benzene was is considered a potential but unlikely vapor intrusion risk. There were only three detections of benzene in soil at concentrations exceeding the MTCA Method A CUL. The three exceedances are limited to soil samples from two test pits (TP10 and TP12) located approximately 20 feet apart in the central portion of the Site on the southwest side of the tracks (Figure 8). The samples were located at depths of 4 to 6 ft bgs at TP12 and 6 to 8 ft bgs at both TP10 and TP12. Current and foreseeable future land use preclude any potential for vapor intrusion risks because the area is an active railroad right of way adjacent to a highway. Potential future residential construction overlaying areas of residual soil impact is highly improbable and will be addressed via institutional controls that would prohibit residential development.

  Benzene was detected in groundwater at a concentration greater than its MTCA Method A CUL in one temporary well sample collected in 2004. Since 2004, there has been only one estimated (J-flagged) concentration of benzene in groundwater in a sample from MW-1 in 2008. That single benzene detection was at a concentration slightly greater than the reporting limit but significantly less than the MTCA Method A CUL.

  Therefore, benzene in groundwater is not considered a potential source of vapor intrusion. Additionally, there are no structures overlying areas of soil or groundwater impacts, and future development would be limited due to the presence of the railroad right-of-way and will be managed through institutional controls.

- Direct Surface Water Exposure Pathway: The potential exposure pathway for impacted groundwater discharge to the surface waters of the Wenatchee River, if complete, could result in direct exposure via dermal contact or ingestion or exposure to the aquatic habitat. This potential exposure pathway has been demonstrated to be incomplete based on consistent non-detections for groundwater COPCs throughout the four quarters of 2019 in samples from the downgradient monitoring wells closest to the Wenatchee River (i.e., MW-1, MW-5, and MW-6) as depicted on Figure 7.

4.5 Terrestrial Ecological Evaluation

A simplified Terrestrial Ecological Evaluation (TEE) was performed by a qualified biologist, in accordance with WAC 173-340-7492, Table 749-1, to assess the quality of habitat and potential to attract wildlife in contiguous undeveloped land within a 500-foot radius of the property. These evaluations were used to quantify the potential risk to plants and animals that live entirely or primarily on affected land through Ecology's TEE process.

A simplified TEE Exposure Analysis is required under MTCA to assess potential ecological risk posed by the COPCs and to determine whether a more detailed investigation of potential ecological risk is required. Washington Administrative Code (WAC) 173-340-7490 requires that one of the following actions be taken:

- Documenting a TEE exclusion using the criteria presented in WAC 173-340-7491,
- Conducting a simplified TEE in accordance with WAC 173-340-7492, or
- Conducting a site-specific TEE in accordance with WAC 173-340-7493.

The completed Table 749-1 and a figure showing the acreage determination are included in Appendix B. The estimated area of contiguous undeveloped land within 500 feet of the Site was calculated to be 2.32 acres, which results in a point value of 8. Regarding question 3, the habitat quality was determined to be low (point value of 3) due to the presence of non-native and weedy grass and shrubs species that have been historically disturbed. Regarding question 4, the area is generally isolated from other areas of potential habitat, but birds would be expected to visit the trees and the area may be visited at times by larger mammals passing through (point value of 1). The summation of points from questions 2 through 5 results in a point value of 11. Therefore, the simplified TEE may be ended under WAC 173-340-7492(2)(a)(ii). No further consideration of ecological impacts is required under MTCA.

4.6 Summary

In summary:

- Soil exceedances of COPCs are limited to five areas, with the greatest volume of impacted soil below 6 ft bgs (Figure 8).
- COPCs in soil are not leaching into, or migrating in groundwater, as evidenced by the absence of COPC detections in groundwater samples from downgradient wells throughout all four quarterly monitoring events in 2019.
- Groundwater exceedances have historically been limited to two wells (MW-1 and MW-7) and then only occasionally. Exceedances of the MTCA Method A CULs for DRO and ORO in MW-7 on the southwest (upgradient) side of the tracks were noted in November 2018 and June 2019. Exceedances of the MTCA Method A CULs for DRO and ORO in in MW-1 on the northeast (downgradient) side of the tracks were noted in August 2008 and November 2018 but have not occurred since MW-1 was re-developed. None of the other wells have ever reported an exceedance of a MTCA CUL.
- Groundwater data also demonstrates that there are no releases of impacted groundwater to surface water.
- Among the exposure pathways identified and characterized only direct contact with soil by a construction worker and vapor inhalation by a resident are considered potentially complete exposure pathways. Both exposure pathways will be addressed by institutional controls.

5.0 Proposed Cleanup Standards

This section presents the technical elements used to develop site-specific cleanup standards. There are two primary components to determining cleanup standards: CULs and points of compliance. CULs identify the concentration below which a hazardous substance does not threaten human health or the environment. The goal is to address all media impacted at concentrations greater than applicable CULs with a remedial action, institutional control, or engineering control that prevents exposure to those impacted media. Points of compliance designate the locations on the Facility where those site-specific CULs must be met. Applicable laws and regulations, COCs, media of concern, and cleanup standards, including the established CULs and points of compliance are described in the sections below.

5.1 Applicable or Relevant and Appropriate Requirements

The applicable or relevant and appropriate requirements (ARARs) provide the framework for the Site. WAC sections 173-340-360(2) and 173-340-710(1)(a) require that environmental investigations conducted under MTCA comply with applicable state and federal laws. Applicable laws are defined as those requirements that are legally applicable as well as those that Ecology determines to be both relevant and appropriate. The ARARs reviewed for the environmental investigations were the following:

- MTCA (Chapter 70.105D of the Revised Code of Washington [RCW 70.105D]);
- MTCA Cleanup Regulations (WAC 173-340); and
- The State Environmental Policy Act (RCW 43.21).

5.2 Constituents of Concern

The COCs are the constituents that were detected in soil or groundwater at concentrations exceeding applicable MTCA Method A CULs.

5.2.1 Constituents of Concern in Soil

The following constituents and constituent groups have been identified as the COCs for soil:

- DRO
- ORO
- GRO
- Benzene
- cPAHs (as benzo(a)pyrene toxicity equivalent)
- Naphthalenes[2]

5.2.2 Constituents of Concern in Groundwater

The following constituents and constituent groups have been identified as the COCs for groundwater:

- DRO
- ORO

5.3 Media of Concern

Soil and groundwater are the media of concern at the Site, based on exceedances of MTCA Method A CULs for soil and groundwater.

5.4 Cleanup Standards

As defined in WAC 173-340-700, cleanup standards include establishing the site-specific CULs and the points of compliance at which the CULs are to be attained. The cleanup standards have been established in accordance with WAC 173-340-700 through 173-340-760.

[2] Total value for naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene.

5.4.1 Selected Cleanup Levels

Site-specific CULs are the concentrations of COCs that will be met for the medium of concern at the points of compliance defined for the Site to meet MTCA requirements. The soil and groundwater CULs for the COCs are presented in the following sections.

5.4.1.1 Soil

The selected CULs for soil are the MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses as defined in Table 740-1 of WAC 173-340-900. MTCA Method A CULs for each COC are identified below:

- DRO = 2,000 milligrams per kilogram (mg/kg)
- ORO = 2,000 mg/kg
- GRO = 30 mg/kg (if benzene is present)
- Benzene = 0.03 mg/kg
- cPAHs[3] = 0.1 mg/kg[4]
- Naphthalenes[2] = 5 mg/kg

5.4.1.2 Groundwater

WAC 173-340-720(1)(a) states: "Groundwater cleanup levels shall be based on estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under both current and potential future site use conditions." The selected CULs for groundwater are the MTCA Method A CULs for groundwater as defined in Table 720-1 of WAC 173-340-900:

- DRO = 500 micrograms per liter (µg/L)
- ORO = 500 µg/L

5.4.2 Points of Compliance

The points of compliance are the locations at which the CULs for the COCs must be attained in each medium of concern to meet the requirements for obtaining an NFA determination from Ecology. The points of compliance were established in accordance with WAC 173-340-740(6) for soil and WAC 173-340-720(8) for groundwater.

5.4.2.1 Soil

The points of compliance for soil are defined as all soil throughout the Site where the selected CULs will be attained, based on the potential exposure pathway. The point of compliance protective of human exposure from direct contact is the upper 15 ft bgs. The point of compliance for protection of groundwater is soil throughout the Site. The point of compliance for protection of surface water is surficial soil along the bank of the Wenatchee River.

[3] cPAHs analyzed and detected at the Site include benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenzo(a,h)anthracene.

[4] The total for cPAHs is calculated by multiplying the concentration of each cPAH compound by the toxic equivalency factor (TEF) and summing them for a total cPAH concentration for comparison to the MTCA Method A CUL for benzo(a)pyrene.

5.4.2.2 Groundwater

The point of compliance for groundwater is defined as all groundwater throughout the Site where the selected CULs will be attained. Specific points where compliance may be measured are downgradient monitoring wells MW-1, MW-5, and MW-6.

5.4.2.3 Surface Water

The points of compliance for surface water are the points at which hazardous substances are potentially released to surface waters of the State, which is surface water adjacent to the bank of the Wenatchee River. Groundwater data from downgradient wells (i.e., MW-1, MW-5, and MW-6) demonstrate that COCs are not present in groundwater being released to surface water at concentrations that exceed applicable MTCA CULs.

6.0 Summary, Conclusions, and Recommendations

6.1 Summary and Conclusions

Soil impacts are limited in extent to five areas, four located between Sunset Highway and the railroad tracks, and one located between the railroad tracks and the Wenatchee River (Figure 8). COCs in soil are not leaching to groundwater based on groundwater analytical results between 2012 and 2019, which are mostly non-detections or low concentrations of COCs. Soil impacts would not be expected to migrate to depths below the maximum depth of groundwater, which is shallow and has seasonal fluctuations of only a few feet, or below the impermeable bedrock at depths of between 12 and 20 ft bgs.

Groundwater impacts are limited to occasional historical exceedances of the groundwater CULs for DRO and ORO in samples from MW-7, which is located on the southwest (upgradient) side of the tracks. Except for a single result for the November 2018 groundwater sample from MW-1, analytical results for groundwater samples collected from wells on the northeast downgradient side of the tracks are consistently less than CULs or not detected. Historical (2012 to 2015) and recent (2018 to 2019) groundwater data in downgradient wells along the Wenatchee River demonstrate that surface water is not adversely impacted by groundwater.

6.2 Recommendations

A substantial volume of environmental data has been collected since 2005 to characterize the nature and extent of impacts to soil and groundwater related to a historical release of crude oil that occurred in the 1930s. That data set has been thoroughly evaluated and summarized and supplemented by additional groundwater data collected over the past 16 months as part of the supplemental data gap evaluation required under the AO. This RI report completes and documents that evaluation and presents conclusions that support the recommendations outlined below.

Through the supplemental groundwater data gap evaluation, including the supplemental quarterly groundwater monitoring data collected in 2019, a successful demonstration has been made that no groundwater data gaps remain. The four consecutive quarters of non-detect groundwater results in 2019 from the three point of compliance wells (MW-1, MW-5, and MW-6) clearly demonstrate that residual soil impacts are not a threat to groundwater or surface waters

of the Wenatchee River. The potential soil data gaps indicated by Ecology, specifically, possible shallow soil impacts on the northeast side of the tracks at depths between 0 and 6 ft bgs, were successfully addressed and documented via email correspondence with Ecology in 2019. In a November 12, 2019 email correspondence (Ecology, 2019c), Ecology indicated that they had not identified any data gaps that would preclude the completion of the RI.

Based on the weight of evidence compiled through investigations completed to date, there are currently no complete exposure pathways that could result in risks to human health or the environment from residual soil impacts or occasional groundwater CUL exceedances in one well on the southwest side of the tracks. Residual soil and groundwater impacts can be managed via institutional controls through the filing of an environmental covenant on the deed for the property in accordance with Ecology guidance.
In consideration of the currently incomplete exposure pathways to human health and the environment and their future management via institutional controls, a no further action (NFA) determination is requested for the Site pending filing of an approved environmental covenant

7.0 References

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Tables

Table 1
Summary of Groundwater Elevation Data
John Michael Lease Site
Cashmere, Washington

Well ID	Date Measured	TOC Elevation (ft)	Depth to Water (ft btoc)	Groundwater Elevation (ft)
MW-1	08/06/08	804.01	13.94	790.07
	04/07/09		13.96	790.05
	09/25/12		13.98	790.03
	12/11/12		13.66	790.35
	03/20/13		13.40	790.61
	06/19/13		11.86	792.15
	08/11/15		14.32	789.69
	11/07/18		13.41	790.60
	03/26/19		13.60	790.41
	06/20/19		12.90	791.11
	09/19/19		13.94	790.07
	11/20/19		13.91	790.10
MW-2	08/06/08	801.22	9.00	792.22
	04/07/09		9.12	792.10
	09/25/12		9.30	791.92
	12/11/12		8.88	792.34
	03/20/13		8.70	792.52
	06/19/13		7.54	793.68
	08/11/15		9.76	791.46
	11/07/18		6.26	794.96
	03/26/19		8.92	792.30
	06/20/19		8.19	793.03
	09/19/19		9.31	791.91
	11/20/19		9.24	791.98
MW-3	08/06/08	798.88	7.83	791.05
	04/07/09		7.79	791.09
	09/25/12		7.70	791.18
	12/11/12		7.62	791.26
	03/20/13		7.54	791.34
	06/19/13		6.64	792.24
	08/11/15		8.14	790.74
	11/07/18		7.59	791.29
	03/26/19		7.65	791.23
	06/20/19		7.23	791.65
	09/19/19		7.58	791.30
	11/20/19		7.83	791.05

Table 1
Summary of Groundwater Elevation Data
John Michael Lease Site
Cashmere, Washington

Well ID	Date Measured	TOC Elevation (ft)	Depth to Water (ft btoc)	Groundwater Elevation (ft)
MW-4	08/06/08	797.99	6.39	791.60
	04/07/09		6.45	791.54
	09/25/12		6.33	791.66
	12/11/12		6.30	791.69
	03/20/13		6.22	791.77
	06/19/13		5.18	792.81
	08/11/15		6.99	791.00
	11/07/18		6.26	791.73
	03/26/19		6.29	791.70
	06/20/19		5.74	792.25
	09/19/19		6.31	791.68
	11/20/19		6.60	791.39
MW-5	11/07/18	802.97	13.09	789.88
	03/26/19		13.18	789.79
	06/20/19		12.66	790.31
	09/19/19		13.31	789.66
	11/20/19		15.20	787.77
MW-6	11/07/18	799.49	10.59	788.90
	03/26/19		10.67	788.82
	06/20/19		10.12	789.37
	09/19/19		11.15	788.34
	11/20/19		10.93	788.56
MW-7	11/07/18	798.92	8.11	790.81
	03/26/19		8.17	790.75
	06/20/19		7.80	791.12
	09/19/19		8.31	790.61
	11/20/19		8.44	790.48

NOTES:
TOC elevations surveyed to NAVD88 by Erlandsen Surveying, November 2018.

ABBREVIATIONS:
TOC = top of casing
ft = feet
ft btoc = feet below top of casing

Table 2
Summary of Soil Analytical Results
TPH and BTEX
John Michael Lease Site
Cashmere, Washington

Analytical results in milligrams per kilogram (mg/kg)

Location ID	Sampled By	Sample Date	Sample Depth (ft bgs)	TOC	TPH					VOCs[c]			
					DRO[a] (w/ SGC)	DRO[a] (w/o SGC)	ORO[a] (w/ SGC)	ORO[a] (w/o SGC)	GRO[b]	Benzene	Toluene	Ethyl-benzene	Xylenes
MTCA Method A Cleanup Levels for Soil[d]				**NE**	**2,000**	**2,000**	**2,000**	**2,000**	**30**	**0.03**	**7**	**6**	**9**
Monitoring Well Borings													
MW-1	Farallon	07/29/08	10.0	--	**38,700**	--	**58,100**	--	**1,250**	**<0.449**	<0.748	3.08	8.14
MW-4	Farallon	07/29/08	5.0	--	11.0	--	80.4	--	<5.07	**<0.0304**	<0.0507	<0.0507	<0.101
MW-5	TRC	10/29/18	16.0	6,140	22.2	41.4	41.4	60.4	2.99 B	<0.00111	<0.00555	<0.00278	<0.00722
MW-6	TRC	10/29/18	10.5	2,350	<4.32	<4.32	<10.8	<10.8	<2.78	<0.00112	<0.00562	<0.00281	<0.00731
MW-6	TRC	10/29/18	12.5	2,530	<4.58	<4.58	<11.5	<11.5	<2.86	<0.00115	<0.00573	<0.00286	<0.00745
MW-7	TRC	10/30/18	10.0	5,570	**2,220**	**4,480**	**2,930**	**4,890**	8.89 B	<0.00102	<0.00511	0.00267	0.0118
MW-7	TRC	10/30/18	12.0	2,960	47.9	51.4	129	129	<2.66	<0.00106	<0.00531	<0.00266	<0.00691
Soil Borings													
B-1	EMR	12/01/04	4.0	--	446	--	**7,610**	--	<4.13	<0.0206	<0.0413	<0.0413	<0.0825
B-2	EMR	12/01/04	8.0	--	**3,620**	--	**7,380**	--	**795**	**<2.11**	<4.21	<4.21	<8.42
B-3	EMR	12/01/04	6.0	--	<24.8	--	<49.5	--	<4.26	<0.0213	<0.0426	<0.0426	<0.0853
B-4	EMR	12/01/04	6.0	--	46.5	--	286	--	<4.21	<0.0237	<0.0475	<0.0475	<0.0949
B-5	EMR	12/01/04	8.0	--	397	--	989	--	**38.7**	0.0294	<0.0421	<0.0421	<0.0841
B-6	EMR	12/01/04	5.0	--	35.9	--	320	--	<4.85	<0.0243	<0.0485	<0.0485	<0.097
B-7	EMR	12/01/04	3.0	--	<24.5	--	<48.9	--	<4.24	<0.0212	<0.0424	<0.0424	<0.0848
B-8	EMR	12/01/04	5.0	--	433	--	**6,320**	--	<4.42	<0.0221	<0.0442	<0.0442	<0.0883
Test Pits													
TP1	Farallon	09/20/07	0-2	--	<19.5	--	314	--	<5.12	<0.0256	<0.205	<0.205	<0.614
TP1	Farallon	09/20/07	6-8	--	**10,500**	--	**20,900**	--	17.3	<0.0240	<0.912	<0.192	<0.576
TP2	Farallon	09/20/07	2-4	--	21.1	--	169	--	<4.41	<0.0221	<0.177	<0.177	<0.530
TP2	Farallon	09/20/07	6-8	--	**2,210**	--	**11,900**	--	16.3	<0.0275	<0.220	<0.220	<0.660
TP3	Farallon	09/20/07	2-4	--	5.63	--	82.8	--	<4.39	<0.0219	<0.175	<0.175	<0.526
TP3	Farallon	09/20/07	4-6	--	8.80	--	79.1	--	<5.19	<0.0259	<0.207	<0.207	<0.622
TP4	Farallon	09/20/07	4-6	--	<3.88	--	85.3	--	<4.32	<0.0216	<0.173	<0.173	<0.518
TP4	Farallon	09/20/07	6-8	--	7.33	--	92.9	--	<4.19	<0.0210	<0.168	<0.168	<0.503
TP5	Farallon	09/20/07	2-4	--	<3.96	--	16.9	--	<4.81	<0.0241	<0.192	<0.192	<0.577
TP5	Farallon	09/20/07	6-8	--	5.29	--	24.0	--	<4.37	<0.0218	<0.175	<0.175	<0.524
TP6	Farallon	09/20/07	4-6	--	<19.9	--	387	--	<4.42	<0.0221	<0.177	<0.177	<0.530
TP6	Farallon	09/20/07	6-8	--	24.5	--	170	--	<4.74	<0.0237	<0.190	<0.190	<0.569
TP7	Farallon	09/20/07	2-4	--	22.1	--	125	--	<5.47	<0.0274	<0.219	<0.219	<0.656
TP7	Farallon	09/20/07	4-6	--	19.1	--	140	--	<4.59	<0.0229	<0.184	<0.184	<0.551
TP8	Farallon	09/20/07	2-4	--	17.4	--	248	--	<5.45	<0.0273	<0.218	<0.218	<0.654
TP8	Farallon	09/20/07	6-8	--	78.9	--	701	--	<5.97	<0.0299	<0.239	<0.239	<0.717
TP9	Farallon	09/20/07	2-4	--	<3.94	--	10.4	--	<4.39	<0.0220	<0.176	<0.176	<0.527
TP9	Farallon	09/20/07	6-8	--	<399	--	**9,260**	--	<5.79	<0.0289	<0.232	<0.232	<0.695
TP10	Farallon	09/20/07	2-4	--	24.4	--	174	--	<5.54	<0.0277	<0.221	<0.221	<0.664
TP10	Farallon	09/20/07	6-8	--	149	--	1,080	--	16.8	**1.73**	0.265	<0.242	1.26
TP11	Farallon	09/20/07	2-4	--	<3.99	--	29.2	--	<4.92	<0.0246	<0.197	<0.197	<0.590
TP11	Farallon	09/20/07	4-6	--	949	--	**6,710**	--	<5.43	<0.0271	<0.217	<0.217	<0.651
TP12	Farallon	09/21/07	4-6	--	<3.92	--	16.5	--	<4.80	**0.202**	<0.192	<0.192	<0.575
TP12	Farallon	09/21/07	6-8	--	23.2	--	183	--	23.4	**1.17**	<0.232	<0.232	<0.695
TP13	Farallon	09/21/07	0-2	--	<38.9	--	412	--	<5.84	<0.0292	<0.234	<0.234	<0.701
TP13	Farallon	09/21/07	6-8	--	<3.88	--	38.2	--	<5.42	<0.0271	<0.217	<0.217	<0.650
TP14	Farallon	09/21/07	4-6	--	<7.90	--	222	--	<4.46	<0.0223	<0.178	<0.178	<0.535
TP14	Farallon	09/21/07	6-8	--	<19.7	--	454	--	<5.49	<0.0275	<0.220	<0.220	<0.659
TP15	Farallon	09/21/07	0-2	--	58.7	--	812	--	<5.44	<0.0272	<0.218	<0.218	<0.653
TP15	Farallon	09/21/07	4-6	--	14.5	--	194	--	<5.73	<0.0286	<0.229	<0.229	<0.687
TP17	Farallon	05/06/08	8	--	<211	--	829	--	<10.6	**<0.0634**	<0.106	<0.106	<0.211
TP18	Farallon	05/08/08	8	--	193	--	1,470	--	<13.7	**<0.0823**	<0.137	<0.137	<0.274
TP21	Farallon	04/06/09	8	--	15.5	--	129	--	--	--	--	--	--
TP22	Farallon	04/06/09	15	--	<11.7	--	52.9	--	--	--	--	--	--
TP23	Farallon	04/06/09	14	--	20.4	--	119	--	--	--	--	--	--
TP24	Farallon	04/06/09	14	--	<10.6	--	<26.4	--	--	--	--	--	--
TP25	Farallon	04/06/09	8	--	318	--	1,880	--	--	--	--	--	--
TP25	Farallon	04/06/09	14	--	**44,500**	--	**61,000**	--	--	--	--	--	--
TP26	Farallon	04/07/09	10	--	<15.5	--	105	--	--	--	--	--	--
TP26	Farallon	04/07/09	16	--	**8,080**	--	**12,900**	--	--	--	--	--	--
TP27	Farallon	04/07/09	8	--	<11.8	--	49.3	--	--	--	--	--	--
TP27	Farallon	04/07/09	12	--	**37,400**	--	**51,500**	--	--	--	--	--	--
TP28	Farallon	04/07/09	10	--	47.5	--	301	--	--	--	--	--	--
TP29	Farallon	04/07/09	8	--	40.1	--	397	--	--	--	--	--	--
TP30	Farallon	06/25/12	14	--	110	--	**19,000**	--	<0.25	<0.00037	<0.00067	<0.00037	<0.0015
TP30	Farallon	06/25/12	16	--	2.4 J	--	7.8 J	--	<0.25	<0.00037	<0.00067	<0.00037	<0.0015
TP31	Farallon	06/25/12	12	--	<2.0	--	<5.0	--	0.28 J	<0.00037	<0.00067	<0.00037	<0.0015
TP31	Farallon	06/25/12	16	--	<2.0	--	<5.0	--	<0.25	<0.00037	<0.00067	<0.00037	<0.0015
TP32	Farallon	06/26/12	12	--	<2.0	--	<5.0	--	<0.25	<0.00037	<0.00067	<0.00037	<0.0015
TP32	Farallon	06/26/12	16	--	<2.0	--	<5.0	--	<0.25	<0.00037	<0.00067	<0.00037	<0.0015
TP33	Farallon	06/25/12	14	--	1,000	--	1,500	--	8.4	<0.00037	<0.00067	0.016	0.049
TP34	Farallon	06/25/12	14	--	120	--	**19,000**	--	**72**	0.0079	0.032	0.20	0.47
TP38	Farallon	06/26/12	4	--	<20	--	98 J	--	<0.25	<0.00037	<0.00067	<0.00037	<0.0015
TP38	Farallon	06/26/12	10	--	60	--	70	--	<0.25	0.0046	<0.00067	<0.00037	<0.0015
TP38	Farallon	06/26/12	12	--	6.0	--	31	--	<0.25	<0.00037	<0.00067	<0.00037	<0.0015
TP38	Farallon	06/26/12	16	--	<2.0	--	<5.0	--	<0.25	<0.00037	<0.00067	<0.00037	<0.0015

Table 2
Summary of Soil Analytical Results
TPH and BTEX
John Michael Lease Site
Cashmere, Washington

Analytical results in milligrams per kilogram (mg/kg)

Location ID	Sampled By	Sample Date	Sample Depth (ft bgs)	TOC	TPH					VOCs[c]			
					DRO[a] (w/ SGC)	DRO[a] (w/o SGC)	ORO[a] (w/ SGC)	ORO[a] (w/o SGC)	GRO[b]	Benzene	Toluene	Ethyl-benzene	Xylenes
MTCA Method A Cleanup Levels for Soil[d]				**NE**	**2,000**	**2,000**	**2,000**	**2,000**	**30**	**0.03**	**7**	**6**	**9**
Test Trenches													
T1-NE	Farallon	05/06/08	8	--	<58.5	--	201	--	<11.3	**<0.0679**	0.117	<0.113	<0.226
T1-SW	Farallon	05/06/08	8	--	205	--	942	--	<12.6	**<0.0755**	<0.126	<0.126	<0.252
T2-NE	Farallon	05/06/08	8	--	<1,410	--	**3,960**	--	<12.0	**<0.0718**	<0.120	<0.120	<0.239
T2-SW	Farallon	05/06/08	8	--	854	--	**3,840**	--	<15.1	**<0.0905**	<0.151	<0.151	<0.302
T3-NE	Farallon	05/07/08	8	--	<53.3	--	137	--	17.6	**<0.0656**	<0.109	<0.109	<0.219
T3-SW	Farallon	05/07/08	8	--	<223	--	973	--	<9.35	**<0.0561**	<0.0935	<0.0935	<0.187
T4-N	Farallon	05/07/08	8	--	**6,890**	--	**13,000**	--	**297**	**<0.494**	<0.823	<0.823	<1.65
T4-S	Farallon	05/07/08	8	--	**2,020**	--	**3,580**	--	**303**	**<0.672**	<1.12	<1.12	<2.24
T5-NE	Farallon	05/06/08	8	--	71.9	--	175.0	--	10.1	**<0.0586**	<0.0977	<0.0977	<0.195
T5-SW	Farallon	05/06/08	8	--	82.9	--	341	--	<15.4	**<0.0923**	<0.154	<0.154	<0.308
T6-N	Farallon	05/07/08	10	--	**18,100**	--	**24,300**	--	**271**	**<0.0593**	<0.0988	0.135	0.862
T6-S	Farallon	05/07/08	8	--	**12,100**	--	**16,300**	--	**719**	**<0.523**	<0.872	1.44	2.92
T7-N	Farallon	05/08/08	8	--	**6,860**	--	**11,300**	--	**156**	**<0.0500**	<0.0833	<0.0833	0.359
T7-S	Farallon	05/08/08	8	--	**37,600**	--	**51,600**	--	**1,020**	**<0.569**	<0.949	<0.949	3.09
T8-NE	Farallon	05/08/08	6	--	<11.6	--	<29.1	--	<10.5	**<0.0629**	<0.105	<0.105	<0.210
T8-SW	Farallon	05/08/08	6	--	<12.0	--	<30.0	--	<10.4	**<0.0627**	<0.104	<0.104	<0.209

NOTES:
Results in **bold** denote concentrations detected at or above the applicable cleanup level (including non-dected results where the reporting limit is above the CUL).
< denotes analyte not detected at or above the given reporting limit.
-- sample was not analyzed for this constituent.
B denotes analyte was detected in the blank and the value presented here may be biased high.
J denotes analyte was detected in the sample at an estimated concentration between the method detection limit and the reporting limit.

ABBREVIATIONS:
ft bgs = feet below ground surface
TOC = total organic carbon
TPH = total petroleum hydrocarbons
VOC = volatile organic compounds
DRO = diesel-range organics
ORO = oil-range organics
GRO = gasoline-range organics
NE = no cleanup level established
EMR = EMR, Inc.
Farallon = Farallon Consulting, LLC
TRC = TRC Environmental
SGC = silica gel cleanup
CUL = cleanup level

FOOTNOTES:
[a] Analyzed by Northwest Method NWTPH-Dx.
[b] Analyzed by Northwest Method NWTPH-Gx.
[c] Analyzed by U.S. Environmental Protection Agency Method 8021B, with the exception of 2018 samples (EPA 8260C).
[d] Washington State Department of Ecology, Model Toxics Control Act (MTCA) Cleanup Level and Risk Calculations (CLARC) Tables Method A values for Soil, Chapter 173-340 WAC, MTCA Chapter 70.105D RCW, Uniform Environmental Covenants Act Chapter 64.70 TCW. Publication No. 94-06. Revised May 2019.

Table 3
Summary of Soil Analytical Results
cPAHs and Naphthalenes
John Michael Lease Site
Cashmere, Washington

Analytical results in milligrams per kilogram (mg/kg)

Location ID	Sampled By	Sample Date	Sample Depth (ft bgs)	Semi-Volatile Organic Compounds[a]								
				Benzo (a) anthracene	Chrysene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Indeno (1,2,3-cd) pyrene	Dibenz(a,h) anthracene	cPAHs[c]	Naphthalenes[d]
MTCA Method A Cleanup Levels for Soil[b]				**NE**	**NE**	**NE**	**NE**	**0.10**	**NE**	**NE**	**0.10**	**5**
Monitoring Wells												
MW-5	TRC	10/29/18	16.0	<0.00666	0.00939	<0.00666	<0.00666	<0.00666	<0.00666	<0.00666	< 0.0101	<0.0222
MW-6	TRC	10/29/18	10.5	<0.00648	<0.00648	<0.00648	<0.00648	<0.00648	<0.00648	<0.00648	< 0.0098	<0.0216
MW-6	TRC	10/29/18	12.5	<0.00687	<0.00687	<0.00687	<0.00687	<0.00687	<0.00687	<0.00687	< 0.0104	<0.0229
MW-7	TRC	10/30/18	10.0	0.251	0.668	0.0967	0.0259	**0.130**	<0.00613	<0.00613	**0.1753**	0.6985
MW-7	TRC	10/30/18	12.0	0.00866	0.0199	<0.00638	<0.00638	<0.00638	<0.00638	<0.00638	< 0.0100	0.0252
Test Pits												
TP1	Farallon	09/20/07	0-2	<0.00330	0.0076	<0.00330	<0.00330	<0.00330	<0.00330	<0.00330	0.0026	<0.00330
TP1	Farallon	09/20/07	6-8	<8.28	<8.28	<8.28	<8.28	**<8.28**	<8.28	<8.28	**< 6.25**	**<8.28**
TP2	Farallon	09/20/07	2-4	0.0313	0.0360	0.0642	0.0282	0.0282	0.0188	<0.0156	0.0436	<0.0156
TP2	Farallon	09/20/07	6-8	<8.22	<8.22	<8.22	<8.22	**<8.22**	<8.22	<8.22	**< 6.21**	**<8.22**
TP3	Farallon	09/20/07	2-4	<0.00326	0.00522	0.00424	0.00456	<0.00326	0.00326	<0.00326	0.0032	<0.00326
TP3	Farallon	09/20/07	4-6	<0.00327	<0.00327	<0.00327	<0.00327	<0.00327	<0.00327	<0.00327	< 0.0025	<0.00327
TP4	Farallon	09/20/07	4-6	<0.00316	0.00411	0.00411	0.00348	<0.00316	<0.00316	<0.00316	0.0029	<0.00316
TP4	Farallon	09/20/07	6-8	<0.00327	0.00327	0.00392	<0.00327	<0.00327	<0.00327	<0.00327	0.0027	<0.00327
TP5	Farallon	09/20/07	2-4	<0.00320	<0.00320	<0.00320	<0.00320	<0.00320	<0.00320	<0.00320	< 0.0024	<0.00320
TP5	Farallon	09/20/07	6-8	<0.00332	<0.00332	<0.00332	<0.00332	<0.00332	<0.00332	<0.00332	< 0.0025	<0.00332
TP6	Farallon	09/20/07	4-6	0.00426	0.00623	<0.00328	<0.00328	<0.00328	<0.00328	<0.00328	0.0028	<0.00328
TP6	Farallon	09/20/07	6-8	<0.00323	0.00355	<0.00323	<0.00323	<0.00323	<0.00323	<0.00323	0.0025	<0.00323
TP7	Farallon	09/20/07	2-4	<0.00333	<0.00333	0.00366	<0.00333	<0.00333	<0.00333	<0.00333	0.0027	<0.00333
TP7	Farallon	09/20/07	4-6	<0.0323	<0.0323	<0.0323	<0.0323	<0.0323	<0.0323	<0.0323	< 0.0024	<0.0323
TP8	Farallon	09/20/07	2-4	0.0155	0.0152	0.0107	0.00939	0.00615	0.00324	<0.00324	0.0103	0.0120
TP8	Farallon	09/20/07	6-8	0.163	0.202	0.264	0.117	**0.1300**	0.0358	0.0391	**0.1939**	0.094
TP9	Farallon	09/20/07	2-4	<0.00332	<0.00332	<0.00332	<0.00332	<0.00332	<0.00332	<0.00332	< 0.0025	<0.00332
TP9	Farallon	09/20/07	6-8	<16.6	<16.6	<16.6	<16.6	**<16.6**	<16.6	<16.6	**< 12.533**	**<16.6**
TP10	Farallon	09/20/07	2-4	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	<0.0330	< 0.0249	<0.0330
TP10	Farallon	09/20/07	6-8	<0.0162	0.0276	<0.0162	<0.0162	<0.0162	<0.0162	<0.0162	< 0.0124	0.0227
TP11	Farallon	09/20/07	2-4	0.00364	0.00430	0.00530	0.00331	<0.00331	0.00331	<0.00331	0.0034	0.00662
TP11	Farallon	09/20/07	4-6	<0.163	<0.163	<0.163	<0.163	**<0.163**	<0.163	<0.163	**< 0.1231**	<0.163
TP12	Farallon	09/21/07	4-6	<0.00325	<0.00325	<0.00325	<0.00325	<0.00325	<0.00325	<0.00325	< 0.0025	<0.00325
TP12	Farallon	09/21/07	6-8	0.00657	0.0151	<0.00328	<0.00328	0.0102	0.00722	<0.00328	0.0122	<0.00328
TP13	Farallon	09/21/07	6-8	<0.00329	<0.00329	<0.00329	<0.00329	<0.00329	<0.00329	<0.00329	< 0.0025	<0.00329
TP14	Farallon	09/21/07	4-6	0.147	0.163	0.153	0.171	**0.166**	0.0570	0.0374	**0.2242**	<0.0163
TP14	Farallon	09/21/07	6-8	<0.164	<0.164	<0.164	<0.164	**<0.164**	<0.164	<0.164	**< 0.1238**	<0.164
TP15	Farallon	09/21/07	0-2	<0.162	<0.162	<0.162	<0.162	**<0.162**	<0.162	<0.162	**< 0.1223**	<0.162
TP15	Farallon	09/21/07	4-6	0.168	0.183	0.208	0.159	**0.165**	0.0586	0.0322	**0.2294**	0.0169
TP17	Farallon	05/06/08	8	<0.107	<0.107	<0.107	<0.107	**<0.107**	<0.107	<0.107	**< 1.4667**	<0.107
TP18	Farallon	05/08/08	8	<0.133	<0.133	<0.133	<0.133	**<0.133**	<0.133	<0.133	< 0.0823	<0.133
TP30	Farallon	06/25/12	14	0.0064 J	0.0055 J	0.0083	<0.0013	0.012	0.0018 J	0.0057 J	0.0087	--
TP30	Farallon	06/25/12	16	<0.00062	0.0012 J	0.0011 J	<0.0013	<0.0011	<0.0011	<0.0012	0.0007	--
TP31	Farallon	06/25/12	12	0.0012 J	0.0018 J	0.0015 J	<0.0013	<0.0011	<0.0011	<0.0012	0.0017	--
TP31	Farallon	06/25/12	16	<0.00062	<0.00092	<0.00082	<0.0013	<0.0011	<0.0011	<0.0012	0.0006	--
TP32	Farallon	06/26/12	12	0.0031 J	0.0032 J	0.0046 J	<0.0013	0.0026 J	<0.0011	0.0021 J	0.0042	--
TP32	Farallon	06/26/12	16	<0.00062	<0.00092	<0.00082	<0.0013	<0.0011	<0.0011	<0.0012	0.0006	--
TP33	Farallon	06/25/12	14	0.14 J	0.22 J	0.14 J	<0.067	**0.63**	<0.056	<0.058	**0.19**	--
TP34	Farallon	06/25/12	14	0.27 J	1.0	0.24 J	<0.067	<0.055	<0.056	<0.058	**0.40**	--
TP38	Farallon	06/26/12	4	0.039 J	0.045 J	0.059 J	<0.027	0.026 J	<0.022	0.035 J	0.0556	--
TP38	Farallon	06/26/12	10	0.034 J	0.097	0.082 J	<0.013	**0.11**	<0.011	<0.012	0.0548	--
TP38	Farallon	06/26/12	12	0.0031 J	<0.00092	0.0022 J	<0.0013	0.0029 J	0.0029 J	0.0024 J	0.0040	--
TP38	Farallon	06/26/12	16	<0.00062	<0.00092	<0.00082	<0.0013	<0.0011	<0.0011	<0.0012	0.0006	--
Test Trenches												
T1-NE	Farallon	05/06/08	8	<0.0117	0.0155	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	< 0.0089	<0.0117
T1-SW	Farallon	05/06/08	8	0.0255	0.0502	0.0366	0.0204	0.0230	0.0153	<0.0128	0.0339	0.0153
T2-NE	Farallon	05/06/08	8	<0.282	<0.282	<0.282	<0.282	**<0.282**	<0.282	<0.282	**< 0.2129**	<0.282
T2-SW	Farallon	05/06/08	8	<0.327	<0.327	<0.327	<0.327	**0.4150**	<0.327	<0.327	**0.4984**	<0.327
T3-NE	Farallon	05/07/08	8	<0.530	0.635	<0.530	<0.530	**<0.530**	<0.530	<0.530	0.0289	<0.530
T3-SW	Farallon	05/07/08	8	<0.109	<0.109	<0.109	<0.109	**<0.109**	<0.109	<0.109	< 0.0091	<0.109
T4-N	Farallon	05/07/08	8	<1.59	3.39	<1.59	<1.59	**<1.59**	<1.59	<1.59	**0.1004**	<1.59
T4-S	Farallon	05/07/08	8	0.68	1.56	<0.600	<0.600	**<0.600**	<0.600	<0.600	0.0808	<0.600
T5-NE	Farallon	05/06/08	8	<0.0118	<0.0118	<0.0118	<0.0118	<0.0118	<0.0118	<0.0118	< 0.0109	<0.0118
T5-W	Farallon	05/06/08	8	0.0177	0.0237	<0.0127	<0.0127	<0.0127	<0.0127	<0.0127	**1.3165**	0.28
T6-N	Farallon	05/07/08	10	2.68	7.17	<1.61	<1.61	**<1.61**	<1.61	<1.61	**1.1704**	**97.40**
T6-S	Farallon	05/07/08	8	1.86	4.55	<1.55	<1.55	**<1.55**	<1.55	<1.55	**3.597**	**34.96**
T7-N	Farallon	05/08/08	8	<1.52	3.04	<1.52	<1.52	**<1.52**	<1.52	<1.52	0.0089	**6.98**
T7-S	Farallon	05/08/08	8	5.54	13.8	<4.15	<4.15	**<4.15**	<4.15	<4.15	**1.2264**	**207.80**
T8-NE	Farallon	05/08/08	6	0.0212	0.0236	0.0228	0.0188	0.0204	0.0141	<0.0118	**0.5036**	<0.0118
T8-SW	Farallon	05/08/08	6	<0.0120	<0.0120	<0.0120	<0.0120	<0.0120	<0.0120	<0.0120	**< 0.4039**	0.0376

NOTES:
Results in **bold** denote concentrations reported at or above the applicable cleanup level (including non-dected results where the reporting limit is above the CUL).
< denotes analyte not detected at or above the given reporting limit.
-- sample was not analyzed for this constituent.
J denotes analyte was detected in the sample at an estimated concentration between the method detection limit and the reporting limit.

ABBREVIATIONS:
ft bgs = feet below ground surface
B(a)P = benzo(a)pyrene
TEF = toxic equivalency factor
NE = no cleanup level established
EMR = EMR, Inc.
Farallon = Farallon Consulting, LLC
TRC = TRC Environmental
CUL = cleanup level

FOOTNOTES:
[a] Analyzed by U.S. Environmental Protection Agency Method 8270D-SIM.
[b] Washington State Department of Ecology, Model Toxics Control Act (MTCA) Cleanup Level and Risk Calculations (CLARC) Tables Method A values for Soil, Chapter 173-340 WAC, MTCA Chapter 70.105D RCW, Uniform Environmental Covenants Act Chapter 64.70 TCW. Publication No. 94-06. Revised May 2019.
[c] Total carcinogenic polycyclic aromatic hydrocarbons (cPAHs) derived using the total toxicity equivalency for benzo(a)pyrene method in Section 708(8) of Chapter 173-340 of the Washington Administrative Code. For concentrations reported at less than the laboratory reporting limit, half the reporting limit was used to calculate the TEF.
[d] Naphthalenes include the sum of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Table 4
Summary of Soil Analytical Results
PCBs
John Michael Lease Site
Cashmere, Washington

Analytical results in milligrams per kilogram (mg/kg)

Trench/ Boring Location	Sample Identification	Sampled By	Sample Date	Sample Depth (ft bgs)	Polychlorinated biphenyls[a]									
					Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Aroclor 1268	Total PCBs
MTCA Method A Cleanup Levels for Soil [b]					**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**10**
Test Trenches														
T1-SW	T1-050608-8-SW	Farallon	05/06/08	8	<0.321	<0.642	<0.321	<0.321	<0.321	<0.321	<0.321	<0.321	<0.321	<0.642
T2-NE	T2-050608-8-NE	Farallon	05/06/08	8	<0.281	<0.561	<0.281	<0.281	<0.281	<0.281	<0.281	<0.281	<0.281	<0.561
T3-SW	T3-050708-8-SW	Farallon	05/07/08	8	<0.277	<0.554	<0.277	<0.277	<0.277	<0.277	<0.277	<0.277	<0.277	<0.554
T4-N	T4-050708-8-N	Farallon	05/07/08	8	<0.540	<1.08	<0.540	<0.540	<0.540	<0.540	<0.540	<0.540	<0.540	<1.08
T5-SW	T5-050608-8-SW	Farallon	05/06/08	8	<0.290	<0.581	<0.290	<0.290	<0.290	<0.290	<0.290	<0.290	<0.290	<0.581
T6-N	T6-050708-10-N	Farallon	05/07/08	10	<0.843	<1.69	<0.843	<0.843	<0.843	<0.843	<0.843	<0.843	<0.843	<1.69
T7-S	T7-050808-8-S	Farallon	05/08/08	8	<2.79	<5.57	<2.79	<2.79	<2.79	<2.79	<2.79	<2.79	<2.79	<5.57
T8-NE	T8-050808-6-NE	Farallon	05/08/08	6	<0.295	<0.591	<0.295	<0.295	<0.295	<0.295	<0.295	<0.295	<0.295	<0.591
Soil Borings														
FB-3	FB-3-2.0	Farallon	09/15/15	2	<0.0190	<0.0190	<0.0190	<0.0190	<0.0190	<0.0190	<0.0190	<0.0190	<0.0190	<0.0190
FB-3	FB-3-8.0	Farallon	09/15/15	8	<0.0215	<0.0215	<0.0215	<0.0215	<0.0215	<0.0215	<0.0215	<0.0215	<0.0215	<0.0215
FB-4	FB-4-2.5	Farallon	08/25/15	2.5	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177
FB-4	FB-4-8.5	Farallon	08/25/15	8.5	<0.0178	<0.0178	<0.0178	<0.0178	<0.0178	<0.0178	<0.0178	<0.0178	<0.0178	<0.0178
FB-5	FB-5-2.0	Farallon	09/15/15	2	<0.0185	<0.0185	<0.0185	<0.0185	<0.0185	<0.0185	<0.0185	<0.0185	<0.0185	<0.0185
FB-5	FB-5-10.0	Farallon	09/15/15	10	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177	<0.0177

NOTES:
< denotes analyte not detected at or exceeding the reporting limit listed.

ABBREVIATIONS:
ft bgs = feet below ground surface
PCBs = polychlorinated biphenyls
Farallon = Farallon Consulting, LLC
NE = no cleanup level established

FOOTNOTES:
[a] Samples analyzed by U.S. Environmental Protection Agency Method 8082.
[b] Washington State Department of Ecology, Model Toxics Control Act (MTCA) Cleanup Level and Risk Calculations (CLARC) Tables Method A values for Soil, Chapter 173-340 WAC, MTCA Chapter 70.105D RCW, Uniform Environmental Covenants Act Chapter 64.70 TCW. Publication No. 94-06. Revised May 2019.

Table 5
Summary of Soil Analytical Results
RCRA 8 Metals
John Michael Lease Site
Cashmere, Washington

Analytical results in milligrams per kilogram (mg/kg)

Trench Location	Sample Identification	Sampled By	Sample Date	Sample Depth (ft bgs)	RCRA 8 Metals[a]							
					Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver	Mercury
MTCA Method A Cleanup Levels for Soil[b]					**20**	**NE**	**2**	**2,000**	**1,000**	**NE**	**NE**	**2**
Test Trenches												
T1-SW	T1-050608-8-SW	Farallon	05/06/08	8	5.49	117	<0.577	61.0	23.2	<1.15	<0.577	0.0745
T2-NE	T2-050608-8-NE	Farallon	05/06/08	8	2.63	102	<0.493	77.5	17.4	<0.986	<0.493	<0.0500
T3-SW	T3-050708-8-SW	Farallon	05/07/08	8	4.77	45.7	<0.562	85.6	25.8	<1.12	<0.562	0.0874
T4-N	T4-050708-8-N	Farallon	05/07/08	8	1.83	24.4	<0.557	154	1.00	<1.11	<0.557	<0.0500
T5-SW	T5-050608-8-SW	Farallon	05/06/08	8	12.4	94.3	<0.519	38.8	55.0	<1.04	<0.519	0.0672
T6-N	T6-050708-10-N	Farallon	05/07/08	10	2.83	35.4	<0.562	82.3	6.24	<1.12	<0.562	<0.0500
T7-S	T7-050808-8-S	Farallon	05/08/08	8	4.35	63.2	<0.570	59.6	2.27	<1.14	<0.570	<0.0500
T8-NE	T8-050808-6-NE	Farallon	05/08/08	6	3.89	49.6	<0.502	49.6	16.1	<1.00	<0.502	<0.0500

NOTES:
< denotes analyte not detected at or above the laboratory practical quantitation limit listed.

ABBREVIATIONS:
ft bgs = feet below ground surface
Farallon = Farallon Consulting, L.L.C.
NE = no cleanup level established
RCRA = Resource Conservation and Recovery Act

FOOTNOTES:
[a] Analyzed by U.S. Environmental Protection Agency Methods 6000/6010/7000 Series.
[b] Washington State Department of Ecology, Model Toxics Control Act (MTCA) Cleanup Level and Risk Calculations (CLARC) Tables Method A values for Soil, Chapter 173-340 WAC, MTCA Chapter 70.105D RCW, Uniform Environmental Covenants Act Chapter 64.70 TCW. Publication No. 94-06. Revised May 2019.

Table 6
Summary of Soil Analytical Results
SPLP TPH and VOCs
John Michael Lease Site
Cashmere, Washington

Analytical results in micrograms per liter (µg/L)

Boring Location	Sample Identification	Sampled By	Sample Date	Sample Depth (ft bgs)	TPH			VOCs[c]			
					DRO[a]	ORO[a]	GRO[b]	Benzene	Toluene	Ethyl-benzene	Xylenes
FB-1	FB-1-10.0	Farallon	09/15/15	10	2,660	442	<100	--	--	--	--
FB-2	FB-2-10.0	Farallon	09/15/15	10	<100	<250	<100	--	--	--	--
FB-4	FB-4-8.5	Farallon	08/25/15	8.5	1,800	742	<100	<0.50	<5.0	<0.50	<1.50

NOTES:
-- sample was not analyzed for this constituent.
< denotes analyte not detected at or exceeding the reporting limit listed.

ABBREVIATIONS:
ft bgs = feet below ground surface
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds
DRO = diesel-range organics
ORO = oil-range organics
GRO = gasoline-range organics
Farallon = Farallon Consulting, LLC
SPLP = Synthetic Precipitation Leaching Procedure

FOOTNOTES:
[a] Sample extracted using U.S. Environmental Protection Agency (EPA) Method 1311 and analyzed using Northwest Method NWTPH-Dx.
[b] Sample extracted using EPA Method 1311 and analyzed using Northwest Method NWTPH-Gx.
[c] Sample extracted using EPA Method 1311 and analyzed using EPA Method 8021B.

Table 7
Summary of Soil Analytical Results
SPLP cPAHs and Naphthalenes
John Michael Lease Site
Cashmere, Washington

Analytical results in micrograms per liter (µg/L)

Boring Location	Sample Identification	Sampled By	Sample Date	Sample Depth (ft bgs)	Carcinogenic Polycyclic Aromatic Hydrocarbons[a]							Naphthalenes[b]
					Benzo (a) anthracene	Chrysene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Indeno (1,2,3-cd) pyrene	Dibenz(a,h) anthracene	
FB-1	FB-1-10.0	Farallon	09/15/15	10	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	88.2
FB-2	FB-2-10.0	Farallon	09/15/15	10	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.250
FB-4	FB-4-8.5	Farallon	08/25/15	8.5	0.00577 J	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.250

NOTES:
< denotes analyte not detected at or exceeding the reporting limit listed.
J = Parameter detected at a concentration less than the practical quantitation limit.

ABBREVIATIONS:
ft bgs = feet below ground surface
cPAHs = carcinogenic polycyclic aromatic hydrocarbons
Farallon = Farallon Consulting, LLC
SPLP = Synthetic Precipitation Leaching Procedure

FOOTNOTES:
[a] Samples extracted using U.S. Environmental Protection Agency (EPA) Method 1311 and analyzed using EPA Method 8270C/SIM.
[b] Naphthalenes include the sum of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.

Table 8
Summary of Groundwater Analytical Results
TPH and BTEX
John Michael Lease Site
Cashmere, Washington

Analytical results in micrograms per liter (µg/L)

Well ID	Sampled By	Sample Date	TOC	TPH					VOCs[c]			
				DRO[a] (w/ SGC)	DRO[a] (w/o SGC)	ORO[a] (w/ SGC)	ORO[a] (w/o SGC)	GRO[b]	Benzene	Toluene	Ethyl-benzene	Xylenes
MTCA Method A Cleanup Levels for Groundwater[d]			**NE**	**500**	**500**	**500**	**500**	**800**	**5**	**1,000**	**700**	**1,000**
Monitoring Well Samples												
MW-1	Farallon	08/06/08	--	**1,110**	--	<472	--	145 J	1.09 J	0.7 J	0.893 J	2.84 J
	Farallon	09/25/12	--	<100	--	<250	--	<100	<0.50	<5.0	<0.50	<1.5
	Farallon	12/11/12	--	200	--	150 J	--	<100	<0.50	<5.0	<0.50	<1.5
	Farallon	03/20/13	--	100	--	<250	--	<100	<0.50	0.23 J	<0.50	0.82 J
	Farallon	06/19/13	--	110	--	<250	--	<100	<0.50	<5.0	<0.50	<1.5
	Farallon	08/11/15	--	210	--	267	--	<100	<0.50	<5.0	<0.50	<1.5
	TRC	11/09/18	2,680	**703**	**1,760**	**1,220**	**2,760**	<100	<1.00	<1.00	<1.00	<3.00
	TRC	03/26/19	2,460	<200	262	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
	TRC	06/20/19	1,520	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
	TRC	09/19/19	<1,000	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
	TRC	11/20/19	<1,000	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
MW-2	Farallon	08/06/08	--	<236	--	<472	--	<50	<0.500	<0.500	<0.500	<1.00
	Farallon	09/25/12	--	<100	--	<250	--	<100	<0.50	<5.0	<0.50	<1.5
	Farallon	12/11/12	--	<100	--	<250	--	<100	<0.50	<5.0	<0.50	<1.5
	Farallon	03/20/13	--	<100	--	<250	--	<100	<0.50	<5.0	<0.50	<1.5
	Farallon	06/19/13	--	<100	--	<250	--	<100	<0.50	<5.0	<0.50	<1.5
	Farallon	08/11/15	--	<100	--	<250	--	<100	<0.50	<5.0	<0.50	<1.5
	TRC	11/09/18	1,470	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
MW-3	Farallon	08/06/08	--	<236	--	499	--	<50	<0.500	<0.500	<0.500	<1.00
	Farallon	09/25/12	--	<100	--	<250	--	<100	<0.50	<5.0	<0.50	<1.5
	Farallon	12/11/12	--	90 J	--	<250	--	<100	<0.50	<5.0	<0.50	<1.5
	Farallon	03/20/13	--	<100	--	<250	--	<100	<0.50	0.26 J	<0.50	<1.5
	Farallon	06/19/13	--	57 J	--	<250	--	59 J	<0.50	<5.0	<0.50	<1.5
	Farallon	08/11/15	--	<100	--	<250	--	<100	<0.50	<5.0	<0.50	<1.5
	TRC	11/09/18	2,400	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
MW-4	Farallon	08/06/08	--	<236	--	<472	--	<50	<0.500	<0.500	<0.500	<1.00
	Farallon	09/25/12	--	<100	--	<250	--	<100	<0.50	<5.0	<0.50	<1.5
	Farallon	12/11/12	--	78 J	--	170 J	--	<100	<0.50	<5.0	<0.50	<1.5
	Farallon	03/20/13	--	<100	--	<250	--	<100	<0.50	<5.0	<0.50	<1.5
	Farallon	06/19/13	--	<100	--	<250	--	<50	<0.50	<5.0	<0.50	<1.5
	Farallon	08/11/15	--	<100	--	<250	--	<100	<0.50	<5.0	<0.50	<1.5
	TRC	11/07/18	1,790	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
MW-5	TRC	11/08/18	1,560	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
	TRC	03/26/19	1,030	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
	TRC	06/20/19	1,130	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
	TRC	09/19/19	1,250	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
MW-6	TRC	11/08/18	2,140	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
	TRC	03/26/19	2,060	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
	TRC	06/20/19	2,250	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
	TRC	09/19/19	1,220	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
MW-7	TRC	11/08/18	2,010	200	**743**	<250 J	**707**	<100	<1.00	<1.00	<1.00	<3.00
	TRC	03/26/19	1,650	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
	TRC	06/20/19	6,700	<200	**890**	<250	**610**	<100	<1.00	<1.00	<1.00	<3.00
	TRC	09/19/19	1,290	<200	<200	<250	<250	<100	<1.00	<1.00	<1.00	<3.00
	TRC	11/20/19	1,200 B	<200	<200	<250	<250	257 B	<1.00	<1.00	<1.00	<3.00
Temporary Well Samples												
B-5	EMR	12/01/04	--	**1,290**	--	**2,160**	--	<100	**26.1**	<1.0	<1.0	<2.0
B-6	EMR	12/01/04	--	<254	--	<507	--	<100	<0.5	<1.0	<1.0	<2.0
B-8	EMR	12/01/04	--	<252	--	<505	--	<100	<0.5	<1.0	<1.0	<2.0

NOTES:
Results in **bold** denote concentrations detected at or above the applicable cleanup level.
< denotes analyte not detected at or above the given reporting limit.
-- sample was not analyzed for this constituent.
J denotes analyte was detected in the sample at an estimated concentration between the method detection limit and the reporting limit.
B denotes same analyte was detected in associated blank.

ABBREVIATIONS:
TOC = total organic carbon
TPH = total petroleum hydrocarbons
VOC = volatile organic compounds
DRO = diesel-range organics
ORO = oil-range organics
GRO = gasoline-range organics
NE = no cleanup level established
EMR = EMR, Inc.
Farallon = Farallon Consulting, LLC
TRC = TRC Environmental
SGC = silica gel cleanup

FOOTNOTES:
[a]Analyzed by Northwest Method NWTPH-Dx.
[b]Analyzed by Northwest Method NWTPH-Gx.
[c]Analyzed by USEPA Method 8021B (2008 to 2015) and USEPA Method 8260C or 8260D (2018 and 2019).
[d]Washington State Department of Ecology, Model Toxics Control Act (MTCA) Cleanup Level and Risk Calculations(CLARC) Tables Method A values for Groundwater, Chapter 173-340 WAC, MTCA Chapter 70.105D RCW, Uniform Environmental Covenants Act Chapter 64.70 TCW. Publication No. 94-06. Revised May 2019.

Table 9
Summary of Groundwater Analytical Results
cPAHs and Naphthalene
John Michael Lease Site
Cashmere, Washington

Analytical results in micrograms per liter (µg/L)

Well ID	Sampled By	Sample Date	Semi-Volatile Organic Compounds[a]								
			Benzo (a) anthracene	Chrysene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Indeno (1,2,3-cd) pyrene	Dibenz(a,h) anthracene	cPAHs[c]	Naphthalenes[d]
MTCA Method A Cleanup Levels for Groundwater[b]			**NE**	**NE**	**NE**	**NE**	**0.10**	**NE**	**NE**	**0.10**	**160**
Monitoring Well Samples											
MW-1	Farallon	08/06/08	<0.0943	<0.0943	0.2890	<0.0943	**0.2550**	<0.0943	<0.0943	**0.3032**	5.753
		09/25/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.038	0.253 J
		12/11/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.038	0.451 J
		03/20/13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.038	0.347 J
		06/19/13	0.015 J	0.012 J	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.037	0.128 J
		08/11/15	0.0172 J	0.0245 J	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.037	0.0325 J
	TRC	11/09/18	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
		03/26/19	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
		06/20/19	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
		09/19/19	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
		11/20/19	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
MW-2	Farallon	08/06/08	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	< 0.0712	<0.0943
		09/25/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.038	0.0205 J
		12/11/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.038	<0.020
		03/20/13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.038	0.0536 J
		06/19/13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.038	0.051 J
		08/11/15	0.00657 J	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.036	0.0335 J
	TRC	11/09/18	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
MW-3	Farallon	08/06/08	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	< 0.0712	<0.0943
		09/25/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.038	0.0196 J
		12/11/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.038	<0.020
		03/20/13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.038	0.028 J
		06/19/13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.038	0.0592 J
		08/11/15	0.00570 J	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.036	0.0320 J
	TRC	11/09/18	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
MW-4	Farallon	08/06/08	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	<0.0943	< 0.0712	<0.0943
		09/25/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.038	0.039 J
		12/11/12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.038	0.028 J
		03/20/13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.038	0.031 J
		06/19/13	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.038	0.040 J
		08/11/15	0.00636 J	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	< 0.036	0.0435 J
	TRC	11/07/18	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
MW-5	TRC	11/08/18	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
		03/26/19	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
		06/20/19	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
		09/19/19	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
MW-6	TRC	11/08/18	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
		03/26/19	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
		06/20/19	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
		09/19/19	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
MW-7	TRC	11/08/18	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
		03/26/19	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
		06/20/19	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
		09/19/19	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
		11/20/19	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	< 0.038	<0.25
Temporary Monitoring Well Samples											
B-5	EMR	12/01/04	--	--	--	--	--	--	--		0.64
B-6	EMR	12/01/04	--	--	--	--	--	--	--		1.8
B-8	EMR	12/01/04	--	--	--	--	--	--	--		1.1

NOTES:
Results in **bold** denote concentrations detected at or above the applicable cleanup level.
< denotes analyte not detected at or above the given reporting limit.
-- sample was not analyzed for this constituent.
J denotes analyte was detected in the sample at an estimated concentration between the method detection limit and the reporting limit.

ABBREVIATIONS:
NE = no cleanup level established
EMR = EMR, Inc.
Farallon = Farallon Consulting, LLC
TRC = TRC Environmental
TEF = toxic equivalency factor

FOOTNOTES:
[a] Analyzed by U.S. Environmental Protection Agency Method 8270D-SIM.
[b] Washington State Department of Ecology, Model Toxics Control Act (MTCA) Cleanup Level and Risk Calculations(CLARC) Tables Method A values for Groundwater, Chapter 173-340 WAC, MTCA Chapter 70.105D RCW, Uniform Environmental Covenants Act Chapter 64.70 TCW. Publication No. 94-06. Revised May 2019.
[c] Total carcinogenic polycyclic aromatic hydrocarbons (cPAHs) derived using the total toxicity equivalency for benzo(a)pyrene method in Section 708(8) of Chapter 173-340 of the Washington Administrative Code.
[d] Naphthalenes include the sum of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene.
For concentrations reported at less than the laboratory reporting limit, half the reporting limit was used to calculate the TEF.

Table 10
Summary of Groundwater Field Parameters and Geochemical Data
John Michael Lease Site
Cashmere, Washington

Well ID	Sampled By	Sample Date	Temperature (°C)	pH	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Nitrate[a] (mg/L)	Sulfate[a] (mg/L)	Free Carbon Dioxide[b] (mg/L)	Ferrous Iron[c] (mg/L)	Sulfide[d] (mg/L)	Iron[e] (mg/L)	Iron, Dissolved[e] (mg/L)
MW-1	Farallon	08/06/08	14.78	7.12	0.634	2.02	194.8	--	--	--	--	--	--	--	--
		09/25/12	13.29	6.42	0.546	0.99	110.2	--	2	16	29 T	<0.050 T	<0.050	0.240	<0.100
		12/11/12	11.13	6.57	0.481	1.19	67.8	--	3	16	< 20 T	0.037 J T	0.030 J	0.210	<0.100
		03/20/13	10.15	6.83	0.595	3.22	114.9	--	3.3	23	< 20 T	0.035 J T	<0.050	<0.100	<0.100
		06/19/13	12.79	6.64	0.517	2.13	70.0	--	3.1	15	64 T	0.053 T	< 0.050	0.079 J	0.130
		08/11/15	18.47	6.72	0.567	2.04	93.0	--	--	--	--	--	--	--	--
	TRC	11/09/18	12.29	6.49	0.435	1.12	283.7	515	--	--	--	--	--	--	--
		03/26/19	10.81	7.27	0.490	5.40	180.0	3.25	--	--	--	--	--	--	--
		06/20/19	16.30	6.89	0.587	5.13	93.3	0.02	--	--	--	--	--	--	--
		09/19/19	16.20	6.99	0.521	3.99	67.6	0.75	--	--	--	--	--	--	--
		11/20/19	8.82	6.42	0.338	4.22	-136.3	2.08	--	--	--	--	--	--	--
MW-2	Farallon	08/06/08	17.00	6.72	0.550	3.69	403.5	--	--	--	--	--	--	--	--
		09/25/12	14.83	6.63	0.530	4.31	145.7	--	3.8	16	22 T	<0.050 T	<0.050	0.170	<0.100
		12/11/12	11.53	6.38	0.466	4.35	276.1	--	3.7	16	< 20 T	0.033 J T	< 0.050	0.050 J	<0.100
		03/20/13	9.68	6.89	0.502	5.29	146.6	--	3.6	15	< 20 T	0.530 T	< 0.050	0.210	<0.100
		06/19/13	14.25	7.26	0.521	5.72	316.0	--	3.8	15	42 T	0.033 J T	< 0.050	0.045 J	0.056 J
		08/11/15	20.39	6.91	0.542	3.66	96.0	--	--	--	--	--	--	--	--
	TRC	11/09/18	13.28	6.75	0.402	6.21	270.8	73.3	--	--	--	--	--	--	--
MW-3	Farallon	08/06/08	17.07	6.23	0.548	2.64	432.7	--	—	—	—	—	—	—	—
		09/25/12	16.43	6.38	0.534	0.81	137.6	--	1.4	9.9	39 T	<0.050 T	<0.050	0.046 J	<0.100
		12/11/12	12.44	6.89	0.517	2.11	145.1	--	4.7	17	< 20 T	0.029 J T	0.028 J	0.041 J	<0.100
		03/20/13	9.06	6.79	0.560	4.05	128.3	--	5.1	16	< 20 T	0.031 J T	<0.050	0.017 J	<0.100
		06/19/13	14.55	7.10	0.560	3.08	297.0	--	2.2	14	62 T	0.031 J T	<0.050	0.062 J	0.039 J
		08/11/15	20.53	6.89	0.595	1.25	80.0	--	--	--	--	--	--	--	--
	TRC	11/09/18	13.62	6.64	0.422	1.33	235.2	83.3	--	--	--	--	--	--	--
MW-4	Farallon	08/06/08	16.86	6.35	0.504	5.37	439.1	--	--	--	--	--	--	--	--
		09/25/12	14.30	6.46	0.532	4.14	157.0	--	4	14	22 T	<0.050 T	<0.050	0.057 J	<0.100
		12/11/12	11.95	6.99	0.486	4.59	235.0	--	4.6	16	< 20 T	<0.050 T	0.026 J	0.028 J	<0.100
		03/20/13	10.29	6.82	0.580	6.18	159.6	--	5.4	16	< 20 T	0.029 J T	<0.050	0.058 J	<0.100
		06/19/13	13.18	6.78	0.559	6.50	66.5	--	6.2	14	45 T	0.036 J T	<0.050	0.051 J	0.040 J
		08/11/15	19.76	7.00	0.595	3.75	95.0	--	--	--	--	--	--	--	--
	TRC	11/07/18	13.72	6.78	0.414	6.35	221.0	154	--	--	--	--	--	--	--
MW-5	TRC	11/08/18	12.30	6.83	0.392	5.51	149.8	44.2	--	--	--	--	--	--	--
		03/26/19	11.30	7.34	0.378	6.86	214.4	0.48	--	--	--	--	--	--	--
		06/20/19	14.90	6.91	0.581	6.82	82.3	0.24	--	--	--	--	--	--	--
		09/19/19	16.1	7.04	0.518	4.22	115.3	1.07	--	--	--	--	--	--	--

Table 10
Summary of Groundwater Field Parameters and Geochemical Data
John Michael Lease Site
Cashmere, Washington

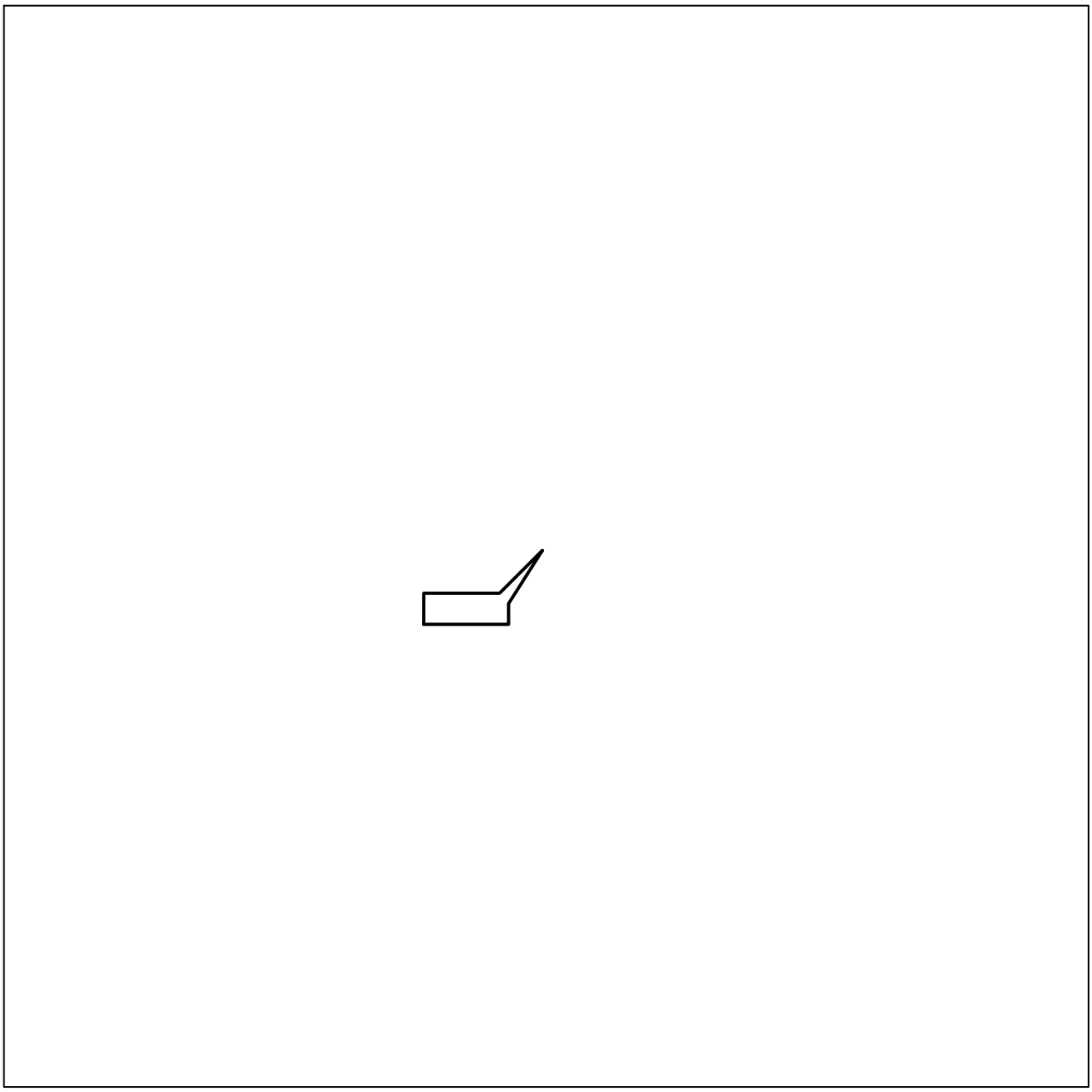
Well ID	Sampled By	Sample Date	Temperature (°C)	pH	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)	Nitrate[a] (mg/L)	Sulfate[a] (mg/L)	Free Carbon Dioxide[b] (mg/L)	Ferrous Iron[c] (mg/L)	Sulfide[d] (mg/L)	Iron[e] (mg/L)	Iron, Dissolved[e] (mg/L)
MW-6	TRC	11/08/18	14.71	6.73	0.425	2.98	39.6	299	--	--	--	--	--	--	--
		03/26/19	9.87	7.23	0.402	12.82	218.3	8.82	--	--	--	--	--	--	--
		06/20/19	14.90	6.73	0.589	3.56	46.1	0.08	--	--	--	--	--	--	--
		09/19/19	15.9	6.89	0.545	3.71	144.7	0.75	--	--	--	--	--	--	--
MW-7	TRC	11/08/18	13.71	6.81	0.411	3.37	120.8	49.7	--	--	--	--	--	--	--
		03/26/19	10.27	7.25	0.400	5.45	149.4	5.60	--	--	--	--	--	--	--
		06/20/19	15.40	6.83	0.650	2.56	102.6	9.53	--	--	--	--	--	--	--
		09/19/19	17.50	6.81	0.559	4.21	37.7	2.28	--	--	--	--	--	--	--
		11/20/19	9.01	6.69	0.344	3.90	-135.8	4.00	--	--	--	--	--	--	--

NOTES:
-- sample was not analyzed for this constituent.

ABBREVIATIONS:
ORP = oxidation-reduction potential
°C = degrees Celsius
mS/cm = milliSiemens per centimeter
mg/L = milligrams per liter
mV = milliVolts
NTU = Nephelometric turbidity units
Farallon = Farallon Consulting, LLC
TRC = TRC Environmental
J = analyte was detected in the sample at an estimated concentration between the method detection limit and the reporting limit
T = sample received past/too close to holding time expiration

FOOTNOTES:
[a] Analyzed by U.S. Environmental Protection Agency (EPA) Method 9056.
[b] Analyzed by Standard Method (SM) 4500CO2.
[c] Analyzed by Conventional Chemistry Parameters by EPA Method/American Public Health Association (APHA) Methods, SM 3500-Fe.
[d] Analyzed by SM 4500-S2.
[e] Analyzed by EPA Method 6010B.

Figures



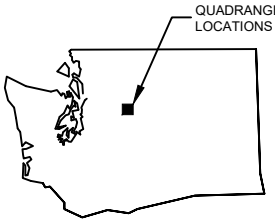
1 MILE 3/4 1/4 0 1 MILE

SCALE 1 : 24,000

N

SOURCE:

United States Geological Survey
7.5 Minute Topographic Maps:
Cashmere and Peshastin Quadrangles,
Washington



PROJECT:

JOHN MICHAEL LEASE SITE
ADJACENT TO 5640 SUNSET HIGHWAY
CASHMERE, WASHINGTON

TITLE:

VICINITY MAP

R. COLLINS		PROJ NO	371322.0000.0000
M. PIOVESAN			
K. WOODBURNE			**FIGURE 1**
DAT	JANUARY 2020		

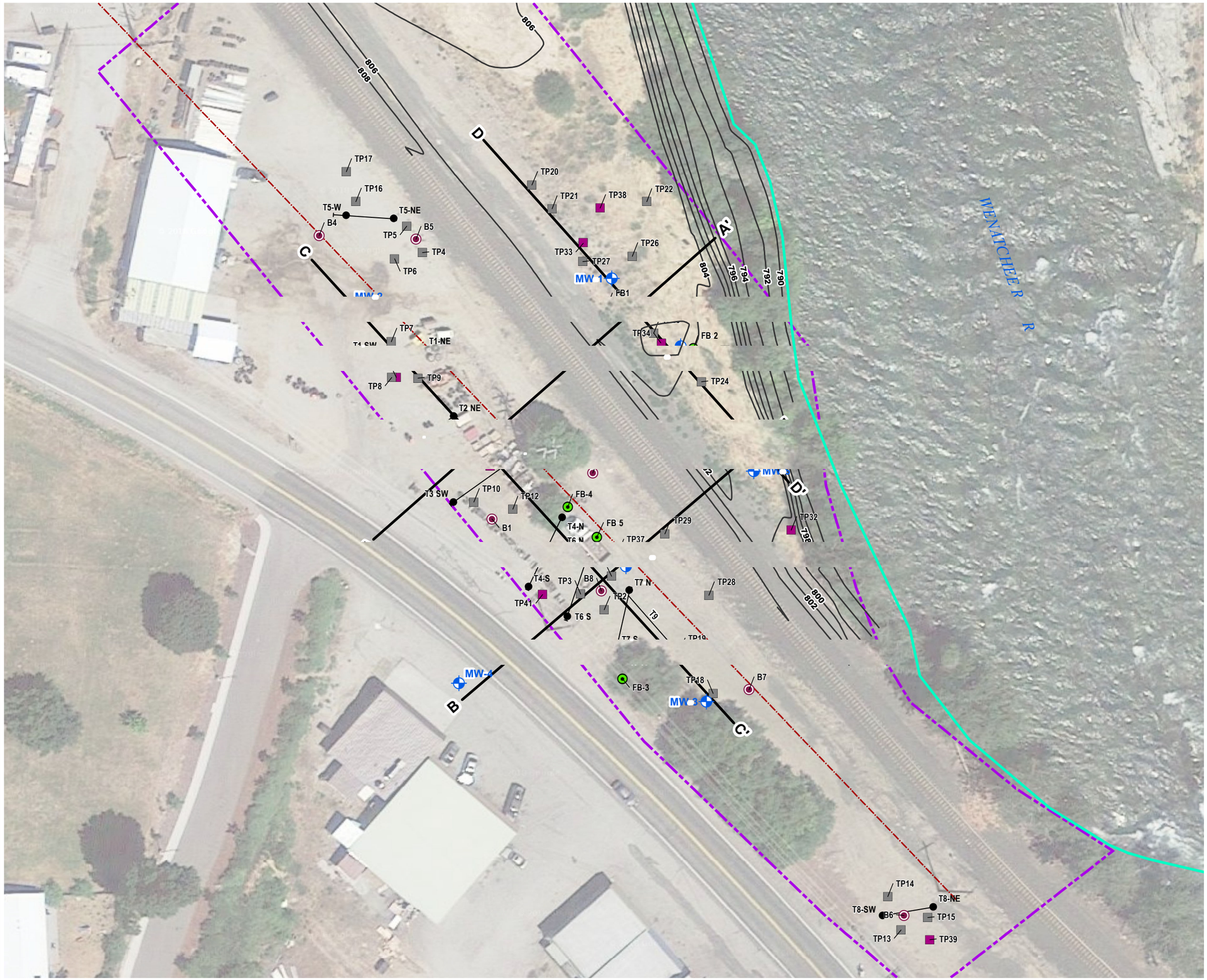
19874 141st Place N.E.
Woo

Fig1_Vicinity Map-5-1-2019.dwg

8.5x11 --- USER: rcollins --- ATTACHED XREFS: --- ATTACHED IMAGES: BNSF Cashmere_Topo, TRC_Reversed Out Blue Logo
DRAWING NAME: L:\CAD_DRAW\Current\BNSF_RR\BNSF Cashmere\ Fig1_Vicinity Map-5-1-2019.dwg --- PLOT DATE: May 01, 2019 - 2:13PM --- LAYOUT: 8x11

Version: 2017-10-21

TRC - GIS



LEGEND

- Monitoring Well (Farallon, 2008 and TRC, 2018)
- Boring (EMR, 2005)
- Soil Boring (Farallon, 2015)
- Cultural Survey Test Pit and/or Soil Sample Test Pit (Farallon, 2012)
- Test Pit (Farallon, 2007, 2008, 2009)
- Trench with soil sample location (Farallon, 2008)
- Ordinary High Water Mark
- Overhead Utility Line
- Site Boundary
- A — A' Cross Section Lines

N

0 50 100 Feet

1 " = 50 '

1:600

PROJECT:

JOHN MICHAEL LEASE SITE
ADJACENT TO 5640 SUNSET HIGHWAY
CASHMERE, WASHINGTON

TITLE:

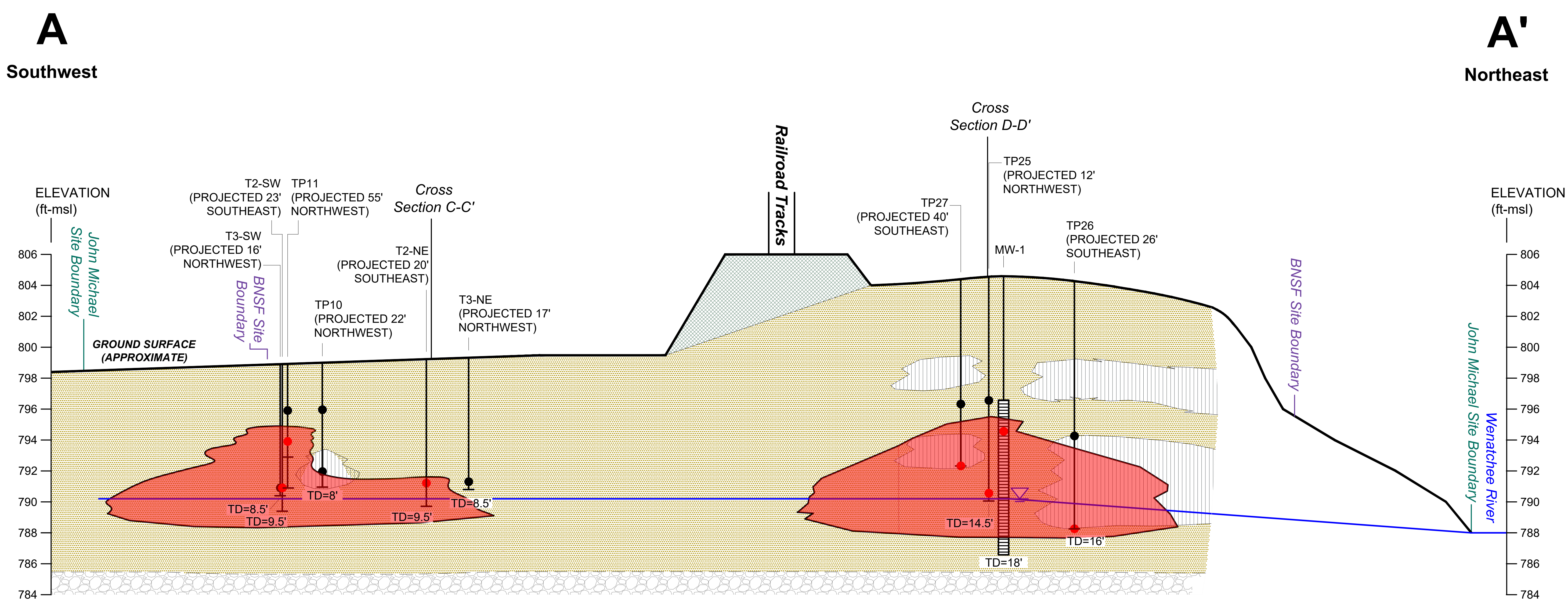
SITE PLAN MAP

DRAWN BY:	R. COLLINS	PROJ. NO.:	361614.0000.0000
CHECKED BY:	M. PIOVESAN		**FIGURE 2**
APPROVED BY:	E. STATA		
DATE:	MARCH 2020		

TRC
19874 141st Place N.E.
Woodinville, WA 98072
Phone: 425.489.1938
www.trccompanies.com

FILE NO.: 361614_SP_CrossSections.mxd

Plot Date: 3/25/2020, 16:08:10 PM by RCOLLINS -- LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\BNSF\361614_JML\Supplemental RI rpt 2019\361614_SP_CrossSections.mxd
Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet (Foot US)
Map Rotation: 0



LITHOLOGY KEY:

- Fill
- Low permeability **(ML)**
- Low to moderate permeability **(SM, GM)**
- Moderate to high permeability **(SP, SW, GW, GP)**
- Bedrock

LEGEND

- Well
- Screen
- Groundwater Elevation (November 2019)
- TD=18' Total depth
- Test pit
- Sample depth with soil analytical results (mg/kg):
  - Soil Sample Depth with Concentration Below MTCA Method A
  - Soil Sample Depth with Concentration Above MTCA Method A
- TD=14.5' Total depth
- Soils with concentrations reported above MTCA Method A cleanup levels

NOTE:
MTCA = Model Toxics Control Act.

10
10
VERTICAL EXAGGERATION = 3:1

HORIZONTAL SCALE (FEET)
0 20 40

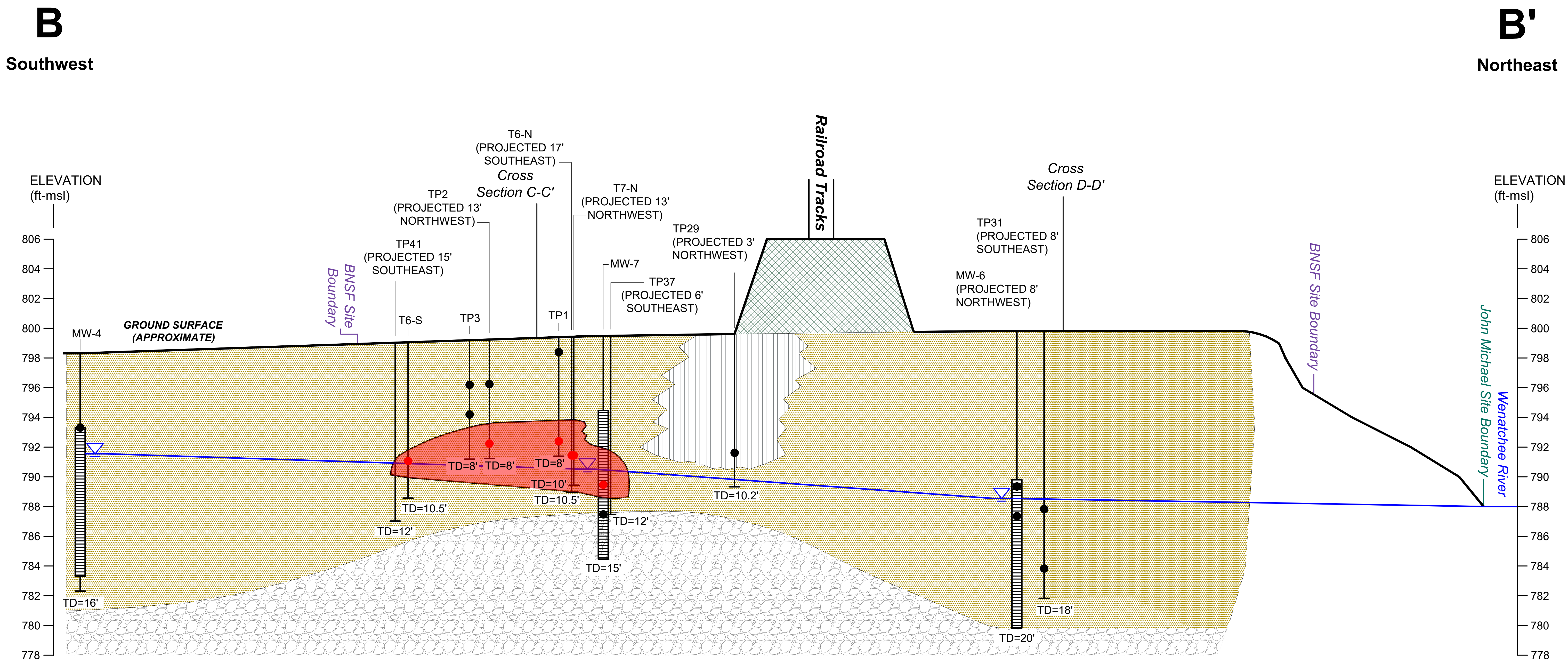
PROJECT:
JOHN MICHAEL LEASE SITE
ADJACENT TO 5640 SUNSET HIGHWAY
CASHMERE, WASHINGTON

TITLE:
CROSS SECTION A-A'

DRAWN BY:	R. Collins	PROJ NO.:	361614.0000.0000
CHECKED BY:	M. Piovesan		**FIGURE 3**
APPROVED BY:	M. Piovesan		
DATE:	February 2020		

TRC
19874 141st Place N.E.
Woodinville, WA 98072
Phone: 425.489.1938
www.trcsolutions.com

FILE NO.: BNSF-JML_Cross Section A-A'.dwg



LEGEND

- Well
- Screen
- Groundwater Elevation (November 2019)
- TD=20' Total depth
- Test pit
- Sample depth with soil analytical results (mg/kg):
  - Soil Sample Depth with Concentration Below MTCA Method A
  - Soil Sample Depth with Concentration Above MTCA Method A
- TD=12' Total depth

LITHOLOGY KEY:

- Fill
- Low permeability **(ML)**
- Low to moderate permeability **(SM, GM)**
- Moderate to high permeability **(SP, SW, GW, GP)**
- Bedrock

Soils with concentrations reported above MTCA Method A cleanup levels

NOTE:
MTCA = Model Toxics Control Act.

10 / 10

VERTICAL EXAGGERATION = 3:1

HORIZONTAL SCALE (FEET)

0 20 40

PROJECT:	JOHN MICHAEL LEASE SITE ADJACENT TO 5640 SUNSET HIGHWAY CASHMERE, WASHINGTON
TITLE:	CROSS SECTION B-B'
DRAWN BY:	R. Collins
PROJ NO.:	361614.0000.0000
CHECKED BY:	M. Piovesan
APPROVED BY:	M. Piovesan
DATE:	February 2020
	FIGURE 4
FILE NO.:	BNSF-JML_Cross Section B-B'.dwg

TRC
19874 141st Place N.E.
Woodinville, WA 98072
Phone: 425.489.1938
www.trcsolutions.com

C

Northwest

C'

Southeast

Cross Section A-A'

Cross Section B-B'

ELEVATION (ft-msl)

802
800
798
796
794
792
790
788
786
784
782

MW-2 TD=16.5'

GROUND SURFACE (APPROXIMATE)

T1-SW (PROJECTED 13' WEST) TD=9.5'

TP7 TD=8'

T1-NE (PROJECTED 12' EAST) TD=7.5'

TP35 (PROJECTED 10' WEST) TD=9.5'

TP9 TD=8'

T2-NE TD=9.5'

TP36 (PROJECTED 4' WEST) TD=8'

T3-NE (PROJECTED 6' EAST) TD=9.5'

TP12 (PROJECTED 10' WEST) TD=8'

FB-4 (PROJECTED 12' EAST) TD=8'

FB-5 (PROJECTED 12' EAST) TD=10'

T4-N (PROJECTED 6' EAST) TD=9.5'

T6-N (PROJECTED 6' EAST) TD=13'

TP37 (PROJECTED 15' EAST) TD=12'

TP1 (PROJECTED 5' EAST) TD=8'

MW-7 (PROJECTED 13' EAST) TD=15'

B8 (PROJECTED 5' WEST) TD=8'

TP2 (PROJECTED 10' WEST) TD=10'

T7-N (PROJECTED 6' EAST)

TP40 (PROJECTED 5' WEST) TD=13'

MW-3 TD=8'

TP18 TD=8'

B7 (PROJECTED 18' EAST) TD=8'

ELEVATION (ft-msl)

LEGEND

- Well
- Screen
- Groundwater Elevation (November 2019)
- TD=20' Total depth
- Test pit, soil boring, or test trench
- Soil Sample Depth with Concentration Below MTCA Method A
- Soil Sample Depth with Concentration Above MTCA Method A
- TD=12' Total depth

LITHOLOGY KEY:

- Fill
- Low permeability **(ML)**
- Low to moderate permeability **(SM, GM)**
- Moderate to high permeability **(SP, SW, GW, GP)**
- Bedrock

Extent of constituents of concern above MTCA Method A cleanup levels

NOTE:
MTCA = Model Toxics Control Act.

10
10
VERTICAL EXAGGERATION = 3:1

HORIZONTAL SCALE (FEET)
0 20 40

PROJECT:
JOHN MICHAEL LEASE SITE
ADJACENT TO 5640 SUNSET HIGHWAY
CASHMERE, WASHINGTON

TITLE:
CROSS SECTION C-C'

DRAWN BY:	R. Collins	PROJ NO.:	361614.0000.0000
CHECKED BY:	M. Piovesan		
APPROVED BY:	M. Piovesan		**FIGURE 5**
DATE:	February 2020		

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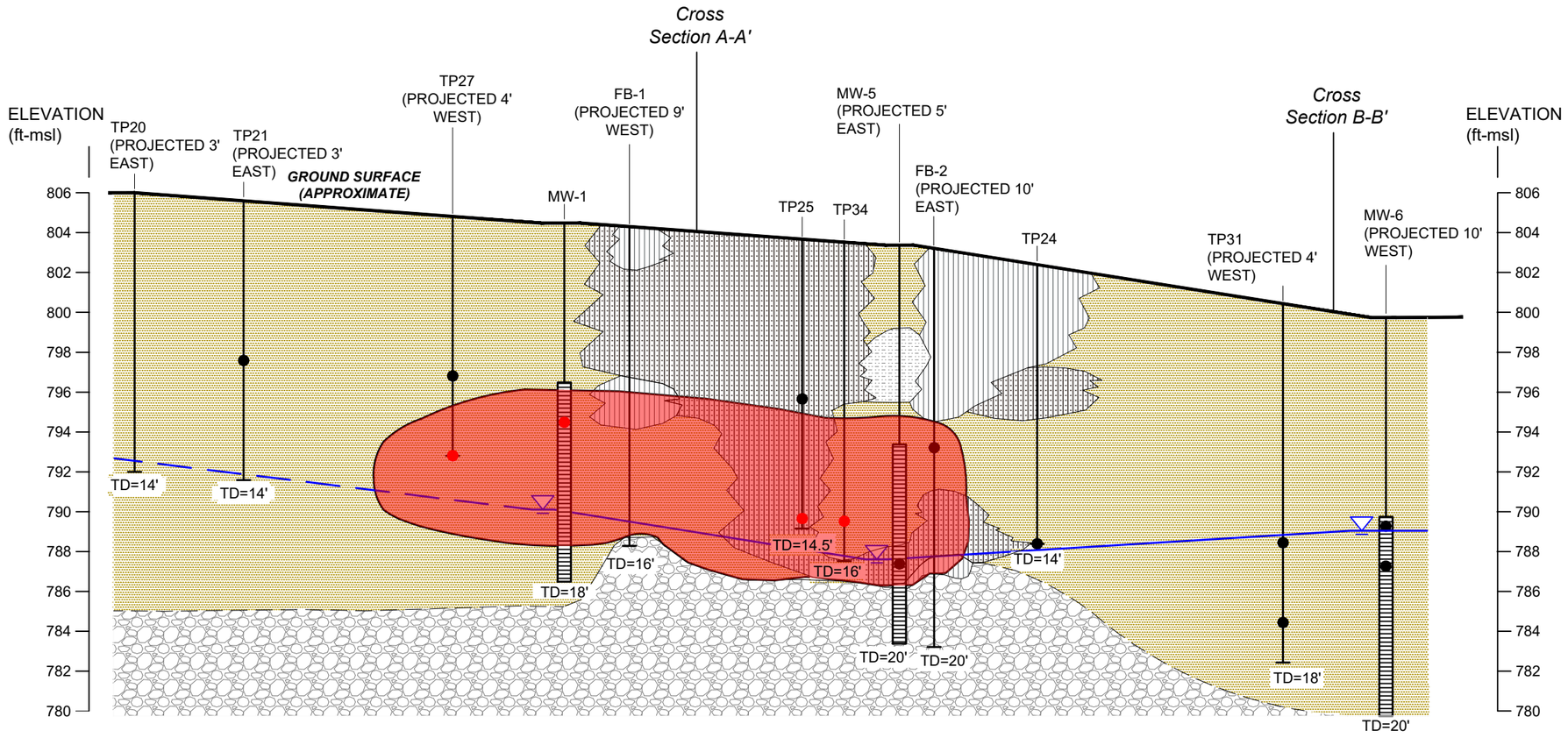
FILE NO.: BNSF-JML_Cross Section C-C'.dwg

D

Northwest

D'

Southeast



LITHOLOGY KEY:

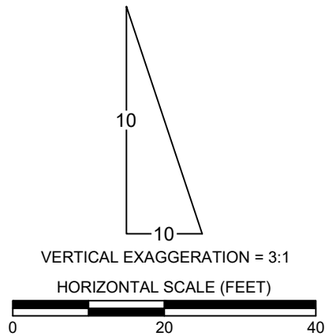
- Fill
- Low permeability **(ML)**
- Low to moderate permeability **(SM, GM)**
- Moderate to high permeability **(SP, SW, GW, GP)**
- Bedrock
- Peat

LEGEND

- Well
- Screen
- Groundwater Elevation (November 2019)
- TD=20' Total depth
- Test pit, soil boring, or test trench
- Soil Sample Depth with Concentration Below MTCA Method A
- Soil Sample Depth with Concentration Above MTCA Method A
- TD=12' Total depth

Extent of constituents of concern above MTCA Method A cleanup levels

NOTE:
MTCA = Model Toxics Control Act.



PROJECT:
JOHN MICHAEL LEASE SITE
ADJACENT TO 5640 SUNSET HIGHWAY
CASHMERE, WASHINGTON

TITLE:
CROSS SECTION D-D'

DRAWN BY:	R. Collins	PROJ NO.:	361614.0000.0000
CHECKED BY:	M. Piovesan		
APPROVED BY:	M. Piovesan		**FIGURE 6**
DATE:	February 2020		

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FILE NO.: BNSF-JML_Cross Section D-D'.dwg

MW-1	Q1	Q2	Q3	Q4
TOC	2,460	1,520	<1,000	<1,000
DRO (SGC)	<200	<200	<200	<200
DRO	262	<200	<200	<200
ORO (SGC)	<250	<250	<250	<250
ORO	<250	<250	<250	<250
GRO	<100	<100	<100	<100
Benzene	<1.00	<1.00	<1.00	<1.00
Toluene	<1.00	<1.00	<1.00	<1.00
Ethyl-enzene	<1.00	<1.00	<1.00	<1.00
Xylenes	<3.00	<3.00	<3.00	<3.00
B(a)P TEF	<0.0500	<0.0500	<0.0500	<0.0500
Naphthalenes	<0.25	<0.25	<0.25	<0.25

MW-5	Q1	Q2	Q3	Q4
TOC	1,030	1,130	1,250	NS
DRO (SGC)	<200	<200	<200	NS
DRO	<200	<200	<200	NS
ORO (SGC)	<250	<250	<250	NS
ORO	<250	<250	<250	NS
GRO	<100	<100	<100	NS
Benzene	<1.00	<1.00	<1.00	NS
Toluene	<1.00	<1.00	<1.00	NS
Ethyl-enzene	<1.00	<1.00	<1.00	NS
Xylenes	<3.00	<3.00	<3.00	NS
B(a)P TEF	<0.0500	<0.0500	<0.0500	NS
Naphthalenes	<0.25	<0.25	<0.25	NS

MW-6	Q1	Q2	Q3	Q4
TOC	2,060	2,250	1,220	NS
DRO (SGC)	<200	<200	<200	NS
DRO	<200	<200	<200	NS
ORO (SGC)	<250	<250	<250	NS
ORO	<250	<250	<250	NS
GRO	<100	<100	<100	NS
Benzene	<1.00	<1.00	<1.00	NS
Toluene	<1.00	<1.00	<1.00	NS
Ethyl-enzene	<1.00	<1.00	<1.00	NS
Xylenes	<3.00	<3.00	<3.00	NS
B(a)P TEF	<0.0500	<0.0500	<0.0500	NS
Naphthalenes	<0.25	<0.25	<0.25	NS

MW-7	Q1	Q2	Q3	Q4
TOC	1,650	6,700	1,290	1,200 B
DRO (SGC)	<200	<200	<200	<200
DRO	<200	**890**	<200	<200
ORO (SGC)	<250	<250	<250	<250
ORO	<250	**610**	<250	<250
GRO	<100	<100	<100	257 B
Benzene	<1.00	<1.00	<1.00	<1.00
Toluene	<1.00	<1.00	<1.00	<1.00
Ethyl-enzene	<1.00	<1.00	<1.00	<1.00
Xylenes	<3.00	<3.00	<3.00	<3.00
B(a)P TEF	<0.0500	<0.0500	<0.0500	<0.0500
Naphthalenes	<0.25	<0.25	<0.25	<0.25

LEGEND

- Monitoring Well (Farallon, 2008 and TRC, 2018)
- Boring (EMR, 2005)
- Soil Boring (Farallon, 2015)
- Cultural Survey Test Pit and/or Soil Sample Test Pit (Farallon, 2012)
- Test Pit (Farallon, 2007, 2008, 2009)
- Trench with soil sample location (Farallon, 2008)
- Ordinary High Water Mark
- Overhead Utility Line
- Site Boundary
- 791.30 — Groundwater Elevation (September 2019)
- 791 — Interpreted Groundwater Elevation Contour Line (September 2019) Dashed where inferred
- Interpreted Gradient Direction (September 2019)

NOTES:
Total petroleum hydrocarbons as:
TOC = Total organic carbon
DRO = Diesel-range organics
DRO (SGC) = Diesel-range organics with SGC
ORO = Heavy oil-range organics
ORO (SGC) = Heavy oil-range organics with SGC
GRO = Gasoline-range organics
SGC = Silica gel cleanup
NS = not sampled
B = analyte found in the associated blank
B(a)P TEF = Total carcinogenic polycyclic aromatic hydrocarbons (cPAHs) derived using the total toxicity equivalency factor for benzo(a)pyrene (B[a]P)

Results in bold denote concentrations detected at or above the applicable cleanup level.

Monitoring wells MW-2, MW-3, and MW-4 were not sampled during the 2019 sampling events.

Groundwater analytical results in micrograms per liter (µg/L)

Q1: 1st Quarter 2019, conducted on March 26, 2019
Q2: 2nd Quarter 2019, conducted on June 20, 2019
Q3: 3rd Quarter 2019, conducted on September 19, 2019
Q4: 4th Quarter 2019, conducted on November 20, 2019

N

0 50 100 Feet

1 " = 50 '
1:600

PROJECT:
JOHN MICHAEL LEASE SITE
ADJACENT TO 5640 SUNSET HIGHWAY
CASHMERE, WASHINGTON

TITLE:
2019 QUARTERLY GROUNDWATER MONITORING ANALYTICAL RESULTS AND Q3 2019 GROUNDWATER ELEVATION CONTOUR MAP

DRAWN BY:	R. COLLINS	PROJ. NO.:	361614.0000.0000
CHECKED BY:	M. PIOVESAN		
APPROVED BY:	E. STATA		**FIGURE 7**
DATE:	MARCH 2020		

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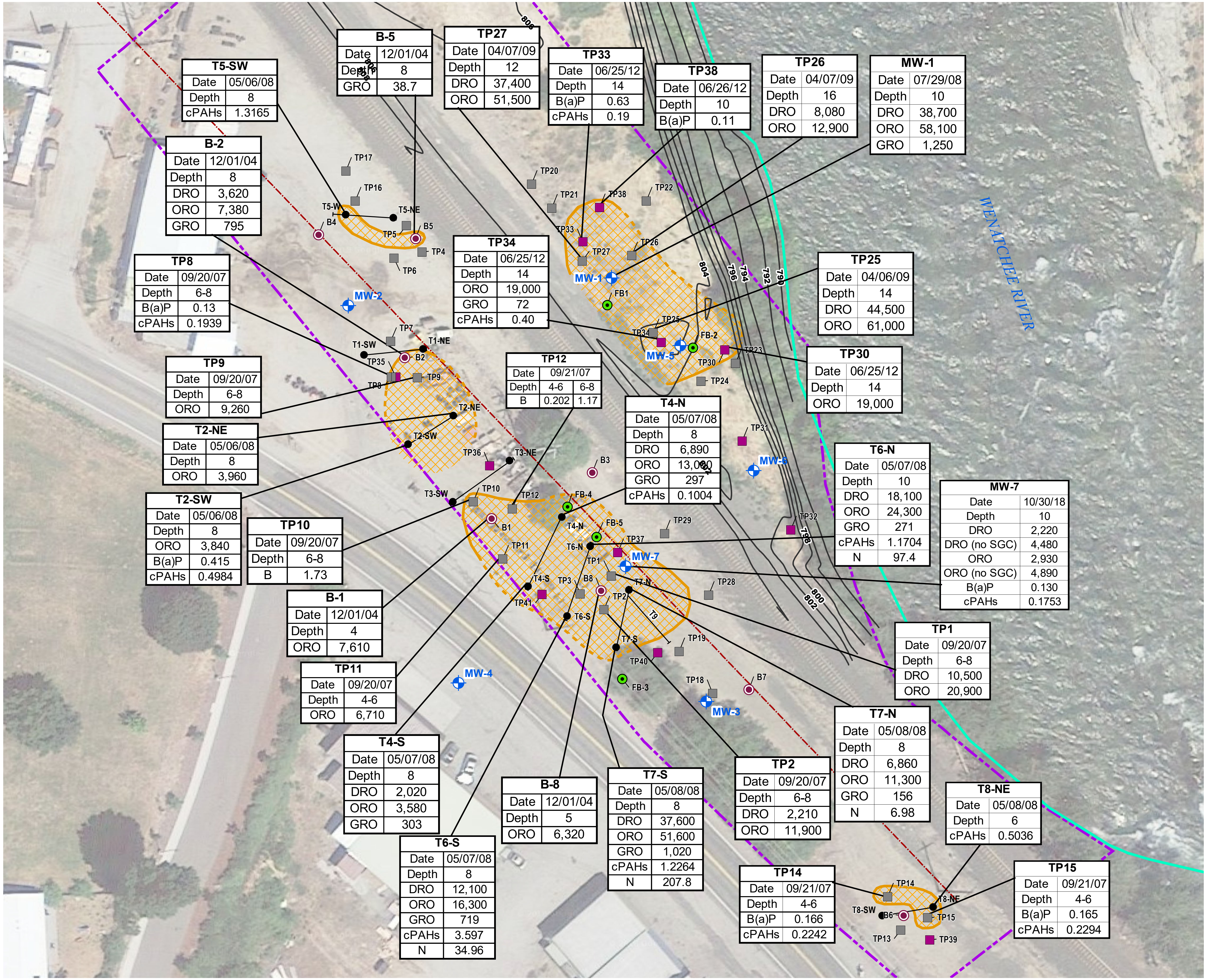
FILE NO.: 361614_Qtrly_GW_Analytical_Results.mxd

Plot Date: 3/19/2020, 14:03:58 PM by RCOLLINS -- LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\BNSF\361614_JML\Supplemental RI rpt 2019\361614_Qtrly_GW_Analytical_Results.mxd
Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet (Foot US)
TRC - GIS



LEGEND

- Monitoring Well (Farallon, 2008 and TRC, 2018)
- Boring (EMR, 2005)
- Soil Boring (Farallon, 2015)
- Cultural Survey Test Pit and/or Soil Sample Test Pit (Farallon, 2012)
- Test Pit (Farallon, 2007, 2008, 2009)
- Trench with soil sample location (Farallon, 2008)
- Ordinary High Water Mark
- Overhead Utility Line
- Site Boundary
- Extent of constituents of concern above Model Toxics Control Act Method A Cleanup Levels in soil. Dashed when inferred.

MTCA Method A Cleanup Levels for soil (mg/kg)

DRO	2,000
DRO (no SGC)	2,000
ORO	2,000
ORO (no SGC)	2,000
GRO	30
B	0.03
B(a)P	0.1
cPAHs	0.1
N	5

NOTES:

DRO = Diesel-range organics with SGC
DRO (no SGC) = Diesel-range organics without SGC
ORO = Heavy oil-range organics with SGC
ORO (no SGC) = Heavy oil-range organics without SGC
GRO = Gasoline-range organics
B = benzene
B(a)P = benzo(a)pyrene
cPAHs = carcinogenic polycyclic aromatic hydrocarbons
N = naphthalenes
SGC = silica gel cleanup
MTCA = Model Toxics Control Act

Data shown on this figure are limited to soil concentrations reported above the laboratory detection limit and above MTCA Method A cleanup levels.

Analytical results in milligrams per kilogram (mg/kg).

Sample depths are in feet below ground surface.

0 50 100 Feet
1 " = 50 '
1:600

N

PROJECT:
JOHN MICHAEL LEASE SITE
ADJACENT TO 5640 SUNSET HIGHWAY
CASHMERE, WASHINGTON

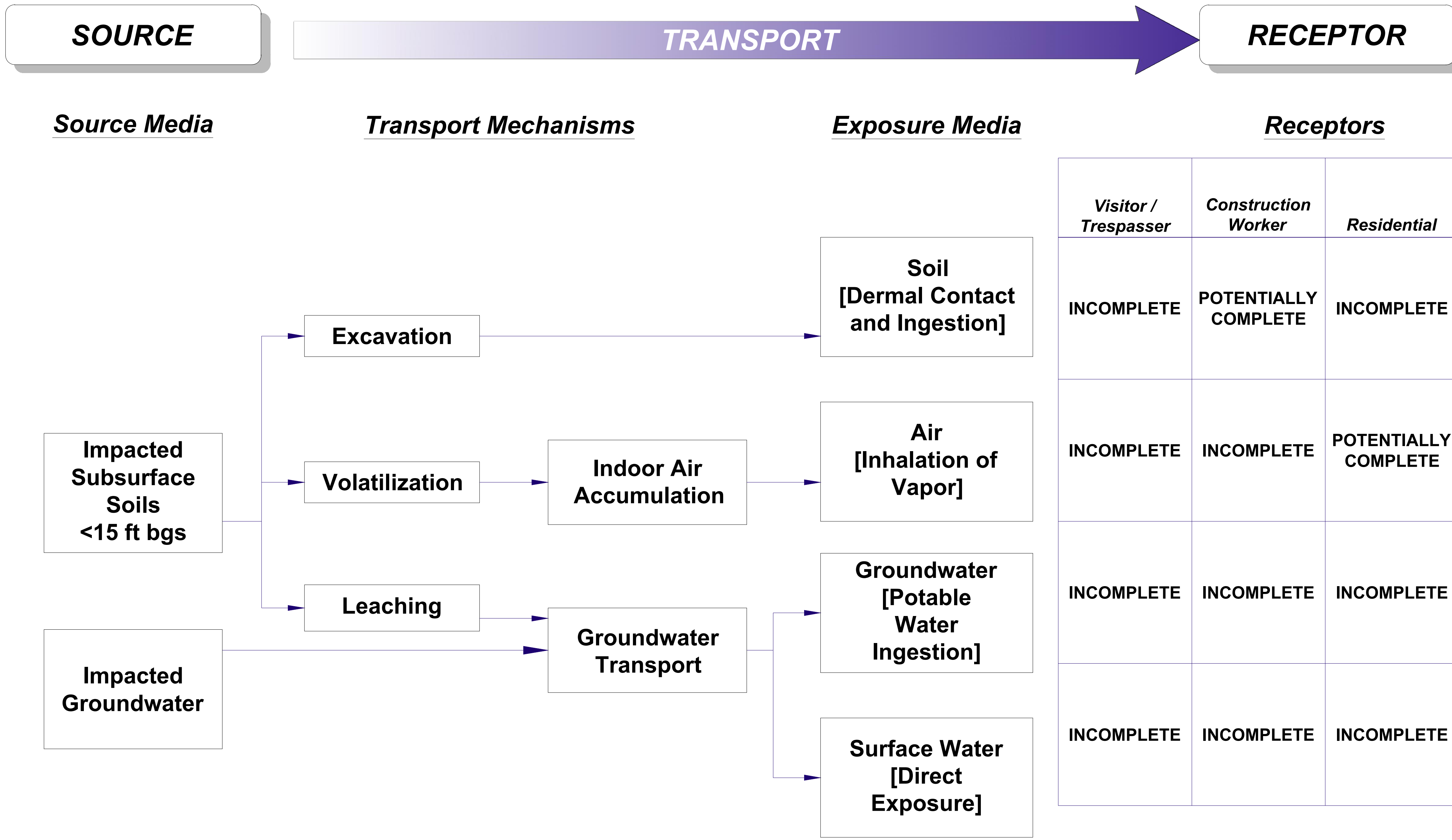
TITLE:
SOIL EXCEEDANCES MAP

DRAWN BY:	R. COLLINS	PROJ. NO.:	361614.0000.0000
CHECKED BY:	M. PIOVESAN		
APPROVED BY:	E. STATA		FIGURE 8
DATE:	MARCH 2020		

TRC
19874 141st Place N.E.
Woodinville, WA 98072
Phone: 425.489.1938
www.trccompanies.com

FILE NO.: 361614_Soil_Exceedances.mxd

Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet (Foot US)
Map Rotation: 0
Plot Date: 3/25/2020, 16:16:08 PM by RCOLLINS -- LAYOUT: ANSI B (11"x17")
Path: S:\1-PROJECTS\BNSF\361614_JML\Supplemental RI rpt 2019\361614_Soil_Exceedances.mxd



Receptors

Visitor / Trespasser	*Construction Worker*	*Residential*	*Aquatic Resources (Wenatchee River)*
INCOMPLETE	POTENTIALLY COMPLETE	INCOMPLETE	N/A
INCOMPLETE	INCOMPLETE	POTENTIALLY COMPLETE	N/A
INCOMPLETE	INCOMPLETE	INCOMPLETE	N/A
INCOMPLETE	INCOMPLETE	INCOMPLETE	INCOMPLETE (No Offsite Groundwater Impacts)

PROJECT:
JOHN MICHAEL LEASE SITE
ADJACENT TO 5640 SUNSET HIGHWAY
CASHMERE, WASHINGTON

TITLE:
EXPOSURE PATHWAYS AND RECEPTORS

R. Collins
M. Piovesan
M. Piovesan
DAT February 2020

361614.0000.0000

FIGURE 9

TRC

19874 141st Place N.E.
Woo

BNSF-JML_Exposure_Pathways-REV.dwg

11x17 --- USER: rcollins --- ATTACHED XREF'S: --- ATTACHED IMAGES: Exposure Pathways and Receptors; Exposure Pathways and Receptors;
DRAWING NAME: L:\CAD_DRAW\Current\BNSF_RR\BNSF Cashmere\Supplemental RI rpt 2019\ BNSF-JML_Exposure_Pathways-REV.dwg --- PLOT DATE: March 18, 2020 - 4:28PM --- LAYOUT: 11X17L

Version: 2017-10-21

Appendix A: Soil Boring Logs

Log of Boring: FB-1

Client: TRC Solutions/ BNSF
Project: John Michael Lease Project
Location: Cashmere, Washington
Farallon PN: 283-006
Logged By: Ken Scott

Date/Time Started:	9/15/15 @ 1400	**Sampler Type:**	~2.5-foot polyethylene sacs
Date/Time Completed:	9/15/15 @ 1520	**Drive Hammer (lbs.):**	Auto
Equipment:	Terra Sonic	**Depth of Water ATD (ft bgs):**	15.0'
Drilling Company:	Holt Drilling	**Total Boring Depth (ft bgs):**	16.0'
Drilling Foreman:	David Dickenson	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Sonic		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		0.0-2.0': Sandy SILT (FILL) (60% silt, 35% sand, 5% gravel), fine to medium sand, fine gravel, tan, moist, no odor, no sheen.	ML	100	NA				Native
		2.0-5.5': Silty SAND with gravel fill (60% sand, 25% silt, 15% gravel), fine to coarse sand, fine to coarse gravel, dark brown, moist, no odor, no sheen, wood debris, green glass, white plastic, and metal nails at 5-feet bgs.	SM			0.0	FB1-2.0		
				100	NA	0.0	FB1-4.0		
5									Bentonite
		5.5-7.5': Silty SAND with gravel (60% sand, 25% silt, 15% gravel), fine to coarse sand, fine to coarse gravel, dark brown, moist, no odor, no sheen.	SM	100	NA	0.0	FB1-6.0		
		7.5-10.0': Sandy SILT (65% silt, 30% sand, 5% gravel), fine to coarse sand, fine to coarse gravel, brown from 7.5 to 8.5-feet, black from 8.5 to 9.5-feet, and dark brown from 9.5 to 10-feet bgs, moist, no odor to 8.5-feet, petroleum-like odor from 8.5 to 10-feet bgs, no sheen to 9-feet, and sheen from 9 to 10-feet bgs, staining from 8.5 to 9.5-feet bgs, subrounded grey, and black gravel, subrounded 4-inch black cobbles.	ML	100	NA	1.3	FB1-8.0		
10		10.0-13.5': Well-graded SAND with gravel (70% sand, 25% gravel, 5% silt), fine to coarse sand, fine to coarse gravel, black from 10 to 12.5-feet, and dark brown from 12.5 to 13.5-feet bgs, moist, petroleum-like odor, sheen, staining from 10 to 12.5-feet bgs, subrounded to subangular grey to black gravel, subrounded 2 to 4-inch black cobbles.	SW			34.2	FB1-10.0	X	
				100	NA	14.2	FB1-12.0		
		13.5-15.5': Well-graded GRAVEL (90% gravel, 5% sand, 5% silt), fine to coarse gravel, fine to coarse sand, greenish grey, moist to wet at 15-feet bgs, no odor, no sheen, subrounded green, grey, and black gravel, subrounded 4-inch black cobbles.	GW	100	NA	3.5	FB1-14.0		
15									▽ Water Level
		15.5-16.0': Bedrock (100% rock), grey, wet to dry, no odor, no sheen.	RK	100	NA	1.2	FB1-16.0		

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA
Filter Pack: NA
Surface Seal: Native
Annular Seal: NA
Boring Abandonment: Bentonite
Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Surveyed Location: X: 191447.17, Y: 172665.5

Log of Boring: FB-2

Client: TRC Solutions/ BNSF
Project: John Michael Lease Project
Location: Cashmere, Washington
Farallon PN: 283-006
Logged By: Ken Scott

Date/Time Started:	9/15/15 @ 1530	**Sampler Type:**	~2.5-foot polyethylene sacs
Date/Time Completed:	9/15/15 @ 1650	**Drive Hammer (lbs.):**	Auto
Equipment:	Terra Sonic	**Depth of Water ATD (ft bgs):**	15.0'
Drilling Company:	Holt Drilling	**Total Boring Depth (ft bgs):**	20.0'
Drilling Foreman:	David Dickenson	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Sonic		

Depth (feet bgs.)	Lithologic Description	USCS	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0	0.0-2.0': Sandy SILT (FILL) (60% silt, 35% sand, 5% gravel), fine to medium sand, fine gravel, tan, moist, no odor, no sheen.	ML	100	NA				Native
	2.0-4.0': SILT with gravel (FILL) (80% silt, 15% gravel, 5% sand), fine to coarse gravel, fine sand, black, moist, no odor, no sheen, black charcoal-like streak (soil appears blackened, and burnt by fire).	ML	100	NA	0.0	FB2-2.0		
5	4.0-6.0': SILT with gravel (FILL) (85% silt, 15% gravel), fine to coarse gravel, black, moist, no odor, no sheen. Observe black charcoal-like streak (soil appears blackened, and burnt by fire), metal wire, and wood debris from 5 to 6-feet bgs.	ML	100	NA	0.0	FB2-4.0		Bentonite
	6.0-8.5': SILT with gravel (85% silt, 15% gravel), fine to coarse gravel, black to dark brown from 7.5 to 8.5-feet bgs, moist, no odor, no sheen, black charcoal-like streak (soil appears blackened, and burnt by fire from 6 to 7.5-feet bgs).	ML	100	NA	0.0	FB2-6.0		
					0.0	FB2-8.0		
10	8.5-12.0': Well-graded GRAVEL with sand (75% gravel, 20% sand, 5% silt), fine to coarse gravel, fine to coarse sand, greenish grey, moist, no odor, no sheen, subrounded green, grey, and black gravel, subrounded 3 to 4-inch grey cobbles.	GW	100	NA	0.0	FB2-10.0	X	
			100	NA				
	12.0-14.5': Silty SAND with gravel (60% sand, 25% silt, 15% gravel), fine to coarse sand, fine to coarse gravel, brown, moist, no odor, no sheen.	SM	100	NA	0.0	FB2-12.0		
					0.0	FB2-14.0		
15	14.5-15.5': Silty SAND with gravel (50% sand, 35% silt, 15% gravel), fine to medium sand, fine to coarse gravel, light brown, moist to wet at 15-feet bgs, no odor, no sheen.	SM						▽ Water Level
	15.5-16.2': SILT (100% silt), greenish grey, wet, no odor, no sheen.	ML	100	NA	0.0	FB2-16.0		
	16.0.2-20.0': Bedrock (100% rock), grey, dry, no odor, no sheen.	RK						
					0.0	FB2-18.0		
20			100	NA				

Well Construction Information

Monument Type:	NA	**Filter Pack:**	NA	**Ground Surface Elevation (ft):**	NA
Casing Diameter (inches):	NA	**Surface Seal:**	Native	**Top of Casing Elevation (ft):**	NA
Screen Slot Size (inches):	NA	**Annular Seal:**	NA	**Surveyed Location:**	**X:** 191429.25
Screened Interval (ft bgs):	NA	**Boring Abandonment:**	Bentonite		**Y:** 1726694.84

Log of Boring: FB-3

Client: TRC Solutions/ BNSF
Project: John Michael Lease Project
Location: Cashmere, Washington
Farallon PN: 283-006
Logged By: Ken Scott

Date/Time Started:	9/15/15 @ 1215	**Sampler Type:**	~2.5-foot polyethylene sacs
Date/Time Completed:	9/15/15 @ 1315	**Drive Hammer (lbs.):**	Auto
Equipment:	Terra Sonic	**Depth of Water ATD (ft bgs):**	9.0'
Drilling Company:	Holt Drilling	**Total Boring Depth (ft bgs):**	10.0'
Drilling Foreman:	David Dickenson	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Sonic		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		0.0-1.5': Sandy SILT with gravel (50% silt, 35% sand, 15% gravel), fine to coarse sand, fine to coarse gravel, brown, moist, no odor, no sheen.	ML	100	NA				Native
		1.5-9.0': Silty SAND with gravel (60% sand, 20% silt, 20% gravel), fine to coarse sand, fine to coarse gravel, dark brown to black from 8-feet, to 9-feet bgs, moist, no odor to 7.5-feet bgs, and petroleum-like odor to 9-feet bgs, no sheen to 7.5-feet bgs, and sheen to 9-feet bgs, staining between 8 to 9-feet bgs, subrounded grey gravel, and 3 to 4-inch subrounded grey cobbles from 1.5 to 7.5-feet bgs, subrounded 2 to 3-inch grey cobbles from 7.5 to 9-feet bgs.	SM			0.0	FB3-2.0	X	
				100	NA	0.0	FB3-4.0		
5									Bentonite
				100	NA	0.0	FB3-6.0		
						2.7	FB3-8.0	X	
				100	NA				▽ Water Level
		9.0-10.0': Well-graded SAND with gravel (75% sand, 20% gravel, 5% silt), fine to coarse sand, fine to coarse gravel, dark brown, black at 9.2-feet bgs, wet, petroleum-like odor, sheen, staining to 9.2-feet bgs, subrounded 3-inch, flat, black rocks.	SW						
10						7.7	FB3-10.0		

Well Construction Information

Monument Type:	NA	**Filter Pack:**	NA	**Ground Surface Elevation (ft):**	NA
Casing Diameter (inches):	NA	**Surface Seal:**	Native	**Top of Casing Elevation (ft):**	NA
Screen Slot Size (inches):	NA	**Annular Seal:**	NA	**Surveyed Location:**	**X:** 191250.87
Screened Interval (ft bgs):	NA	**Boring Abandonment:**	Bentonite		**Y:** 172666.3

Log of Boring: FB-4

Client: TRC Solutions/ BNSF
Project: John Michael Lease Project
Location: Cashmere, Washington
Farallon PN: 283-006
Logged By: Ryan Ostrom

Date/Time Started:	8/25/15 @ 1054	**Sampler Type:**	18-inch SPT
Date/Time Completed:	8/25/15 @ 1245	**Drive Hammer (lbs.):**	140
Equipment:	CME 85	**Depth of Water ATD (ft bgs):**	9.8'
Drilling Company:	Holt Drilling	**Total Boring Depth (ft bgs):**	10.5'
Drilling Foreman:	John Bennet	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Hollow Stem		

Depth (feet bgs.)	Lithologic Description	USCS	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0	0.0-1.2': Sandy SILT (50% silt, 40% sand, 10% gravel), fine to medium sand, fine to medium gravel, light brown, hard, dry, no odor.	ML	80	8/24/23				Native
	1.2-1.5': No recovery.				0.6	FB-4-1.2		
	1.5-2.5': Sandy SILT (50% silt, 40% sand, 10% gravel), fine to medium sand, fine gravel, brown, very stiff, dry, no odor.	ML	66	5/7/10				
	2.5-3.0': No recovery.				1.3	FB-4-2.5	X	
	3.0-3.5': Sandy SILT (50% silt, 40% sand, 10% gravel), fine to medium sand, fine gravel, brown, very stiff, dry, no odor.	ML						
	3.5-4.5': No recovery.		33	8/10/13	0.9	FB-4-3.5		
	4.5-4.9': Sandy SILT (50% silt, 40% sand, 10% gravel), fine to medium sand, fine gravel, brown, hard, dry, no odor.	ML						
5	4.9-5.3': Silty SAND (60% sand, 30% silt, 10% gravel), fine to medium sand, fine to coarse gravel, black, very dense, moist, strong petroleum-like odor.	SM	53	9/22/47	2.2	FB-4-5.3		Bentonite
	5.3-6.0': No recovery.							

Well Construction Information

Monument Type:	NA	**Filter Pack:**	NA	**Ground Surface Elevation (ft):**	NA
Casing Diameter (inches):	NA	**Surface Seal:**	Native	**Top of Casing Elevation (ft):**	NA
Screen Slot Size (inches):	NA	**Annular Seal:**	NA	**Surveyed Location:**	**X:** NA
Screened Interval (ft bgs):	NA	**Boring Abandonment:**	Bentonite		**Y:** NA

Log of Boring: FB-4

Client: TRC Solutions/ BNSF
Project: John Michael Lease Project
Location: Cashmere, Washington
Farallon PN: 283-006
Logged By: Ryan Ostrom

Date/Time Started:	8/25/15 @ 1054	**Sampler Type:**	18-inch SPT
Date/Time Completed:	8/25/15 @ 1245	**Drive Hammer (lbs.):**	140
Equipment:	CME 85	**Depth of Water ATD (ft bgs):**	9.8'
Drilling Company:	Holt Drilling	**Total Boring Depth (ft bgs):**	10.5'
Drilling Foreman:	John Bennet	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Hollow Stem		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
		6.0-6.4': Silty SAND (60% sand, 30% silt, 10% gravel), fine to medium sand, fine to coarse gravel, brown, dense, moist, strong petroleum-like odor.	SM							
		6.4-6.9': Silty SAND (60% sand, 30% silt, 10% gravel), fine to medium sand, fine to coarse gravel, black, dense, moist, strong petroleum-like odor.	SM		60	4/22/20	27.2	FB-4-6.9		
		6.9-7.5': No recovery.								
		7.5-8.5': Well-graded SAND with silt and gravel (50% sand, 40% gravel, 10% silt), fine to coarse sand, fine to coarse gravel, black, dense, moist, strong petroleum-like odor, staining.	SW-SM		66	13/17/31				
		8.5-9.0': No recovery.					114.2	FB-4-8.5	X	
		9.0-9.8': Silty SAND (50% sand, 40% silt, 10% gravel), fine to coarse sand, fine to coarse gravel, black, very dense, moist, strong petroleum-like odor, staining.	SM							
10		9.8-9.9': Well-graded SAND with silt and gravel (50% sand, 40% gravel, 10% silt), fine to coarse sand, fine to coarse gravel, very dense, wet, petroleum-like odor.	SW-SM		60	8/22/30	82.5	FB-4-9.9		Water Level
		9.9-10.5': No recovery.								

Well Construction Information

Monument Type:	NA	**Filter Pack:**	NA	**Ground Surface Elevation (ft):**	NA
Casing Diameter (inches):	NA	**Surface Seal:**	Native	**Top of Casing Elevation (ft):**	NA
Screen Slot Size (inches):	NA	**Annular Seal:**	NA	**Surveyed Location:**	**X:** NA
Screened Interval (ft bgs):	NA	**Boring Abandonment:**	Bentonite		**Y:** NA

Log of Boring: FB-5

Client: TRC Solutions/ BNSF
Project: John Michael Lease Project
Location: Cashmere, Washington
Farallon PN: 283-006
Logged By: Ken Scott

Date/Time Started:	9/15/15 @ 1110	**Sampler Type:**	~2.5-foot polyethylene sacs
Date/Time Completed:	9/15/15 @ 1210	**Drive Hammer (lbs.):**	Auto
Equipment:	Terra Sonic	**Depth of Water ATD (ft bgs):**	11.0'
Drilling Company:	Holt Drilling	**Total Boring Depth (ft bgs):**	13.0'
Drilling Foreman:	David Dickenson	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Sonic		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		0.0-3.5': Well-graded GRAVEL with sand (50% gravel, 45% sand, 5% silt), fine to coarse gravel, fine to coarse sand, tan to grey, moist, no odor, no sheen.	GW		100	NA	0.0	FB5-2.0	X	Native
5		3.5-11.0': Silty SAND with gravel (60% sand, 20% silt, 20% gravel), fine to coarse sand, fine to coarse gravel, tan from 3.5 to 4-feet, black from 4 to 10.5-feet, and light black from 10.5 to 11-feet bgs, moist, petroleum-like odor, sheen, staining between 4 to 10.5-feet bgs,subrounded grey gravel, 3 to 4-inch subrounded grey cobbles from 4 to 11-feet bgs.	SM		100	NA	1.5	FB5-4.0		
					100	NA	13.6	FB5-6.0		Bentonite
					100	NA	14.2	FB5-8.0		
10							20.8	FB5-10.0	X	
		11.0-13.0': Well-graded SAND with gravel (75% sand, 20% gravel, 5% silt), fine to coarse sand, fine to coarse gravel, brown, wet, petroleum-like odor, sheen.	SW		100	NA	4.1	FB5-12.0		Water Level
					100	NA	0.0			

Well Construction Information

Monument Type:	NA	**Filter Pack:**	NA	**Ground Surface Elevation (ft):**	NA
Casing Diameter (inches):	NA	**Surface Seal:**	Native	**Top of Casing Elevation (ft):**	NA
Screen Slot Size (inches):	NA	**Annular Seal:**	NA	**Surveyed Location:**	**X:** 191304.72
Screened Interval (ft bgs):	NA	**Boring Abandonment:**	Bentonite		**Y:** 1726639.40

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Log of Boring: MW1

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: T. Adams

Date/Time Started:	7/29/08 1530	**Sampler Type:**	D&M 18"
Date/Time Completed:	7/29/08 1620	**Drive Hammer (lbs.):**	
Equipment:	Mini Rae 2000 PID	**Depth of Water ATD (ft bgs):**	14
Drilling Company:	Cascade Drilling	**Total Boring Depth (ft bgs):**	18
Drilling Foreman:	Scott Krueger	**Total Well Depth (ft bgs):**	18
Drilling Method:	Hollow-Stem Auger		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed
0						NA	0.0		
		Well-graded SAND with gravel 80% sand 20% gravel, sand ranges from fine to coarse predominantly coarse, light brown, gravels are subangular, dry, no odor, no sheen, grass found in sample.	SW		50	18/20/20	0.8		
5		Well-graded SAND 100% sand ranging from medium to coarse predominantly medium grained, dark grey with one 20mm band of light brown, moist, no odor, no sheen, some burnt wood found in sample.	SW		60	6/6/7	0.8		
		Well-graded SAND 100% sand ranging from medium to coarse predominantly medium grained, dark grey, moist, no odor, no sheen.	SW		90	6/26/28	1.6		
10		Well-graded SAND 100% sand, sand ranges from medium to coarse predominantly medium, black, wet, strong odor, definite sheen, brown staining, amber colored "syrup" looking material, wood chunks also found in sample.	SW		70	35/50	38.1	MW1-10-072908	X
		Well-graded SAND 100% sand, sand ranges from medium to coarse predominantly medium, black, wet, moderate odor, definite sheen, brown staining.	SW		10	28/50	13.5		
15		Well-graded SAND 100% sand, sand ranges from medium to coarse predominantly medium, black, wet, moderate odor, definite sheen, brown staining.	SW		10	34/50	5.1		
		Well-graded SAND 100% sand, sand ranges from medium to coarse predominantly medium, black, wet, moderate odor, definite sheen, brown staining.	SW		100	50	6.7	MW1-17.5-072908	X
20									

Boring/Well Construction Details

Well Construction Information

Monument Type: Flush
Casing Diameter (inches): 2"
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 8-18

Filter Pack: 2/12 Lapis Luster Cemex Sand
Surface Seal: Asphalt
Annular Seal: Bentonite chips & concrete

Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment: NA
Surveyed Location: X: Y:

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Log of Boring: MW2

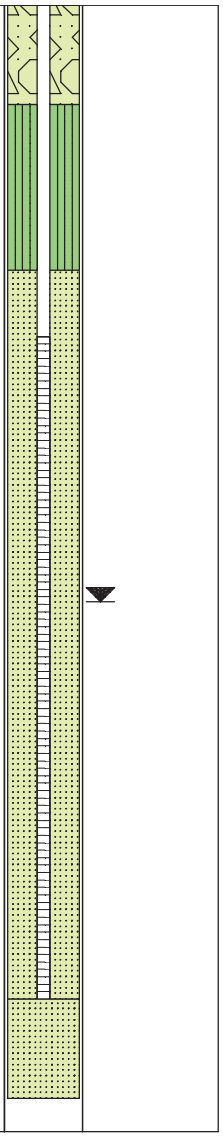
Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: T. Adams

Date/Time Started:	7/29/08 1003	**Sampler Type:**	D&M 18"
Date/Time Completed:	7/29/08 1048	**Drive Hammer (lbs.):**	
Equipment:	Mini Rae 2000 PID	**Depth of Water ATD (ft bgs):**	9
Drilling Company:	Cascade Drilling	**Total Boring Depth (ft bgs):**	16.5
Drilling Foreman:	Scott Krueger	**Total Well Depth (ft bgs):**	15
Drilling Method:	Hollow-Stem Auger		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed
0						NA	0.0		
		Well-graded SAND with gravel 60% sand 40% gravel, sand ranges from fine to coarse, light grey, gravels are angular to subangular, dry, no odor, no sheen.	SW		30	50/5	0.7		
5		Well-graded SAND with gravel 60% sand 40% gravel, sand ranges from fine to coarse, light grey, gravels are angular to subangular, dry, no odor, no sheen.	SW		30	50/6	2.1		
		Well-graded SAND with gravel 85% sand 15% gravel, sand ranges from fine to coarse predominantly coarse, olive grey, gravels are angular to subangular, dry, no odor, no sheen.	SW		10	10/4/12	1.3		
10		Well-graded SAND 95% sand 5% gravel, sand ranges from fine to coarse predominantly coarse, olive grey, moist, slight odor, slight sheen, organic material, paper in sample.	SW		10	33/50	3.5	MW2-080608	X
		Well-graded SAND with silt 85% sand 15% silt, sand ranges from fine to coarse predominantly coarse, light brown, dry, no odor, no sheen (sample looks like riverbed deposits).	SW-SM		90	15/20/25	1.4		
15		Well-graded SAND 90% sand 5% silt, 5% gravels, sand ranges from fine to coarse predominantly coarse, light brown, dry, no odor, no sheen (sample looks like riverbed deposits).	SW		95	15/20/28	2.2		



Well Construction Information

Monument Type: Flush
Casing Diameter (inches): 2"
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 5-15

Filter Pack: 2/12 Lapis Luster Cemex Sand
Surface Seal: Asphalt
Annular Seal: Bentonite chips & concrete

Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment: NA
Surveyed Location: X: Y:

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Log of Boring: MW3

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: T. Adams

Date/Time Started:	7/29/08 1152	**Sampler Type:**	D&M 18"
Date/Time Completed:	7/29/08 1220	**Drive Hammer (lbs.):**	
Equipment:	Mini Rae 2000 PID	**Depth of Water ATD (ft bgs):**	8
Drilling Company:	Cascade Drilling	**Total Boring Depth (ft bgs):**	16
Drilling Foreman:	Scott Krueger	**Total Well Depth (ft bgs):**	15
Drilling Method:	Hollow-Stem Auger		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0						NA	0.0			
		Poorly-graded SAND with gravel 85% sand 15% gravel, sand ranges from fine to coarse predominantly coarse, olive grey with bands of light brown, gravels are angular to subangular, dry, no odor, no sheen, asphalt chunks found in sample.	SP		80	25/15/10	3.4			
5		Well-graded SAND with gravel 85% sand 15% gravel, sand ranges from fine to coarse predominantly coarse, olive grey, gravels are angular to subangular, dry, no odor, no sheen.	SW		45	15/50	-			
		Well-graded SAND with gravel 75% sand 25% gravel, sand ranges from fine to coarse predominantly coarse, olive grey, gravels are angular to subangular, wet, slight odor, slight sheen.	SW		45	25/10/10	-			
10		Well-graded SAND with gravel 75% sand 25% gravel, sand ranges from fine to coarse predominantly coarse, olive grey, gravels are angular to subangular, wet, slight odor, slight sheen.	SW		55	25/27/30	3.1	MW3-080608	X	
		Well-graded SAND with gravel 75% sand 25% gravel, sand ranges from fine to coarse predominantly coarse, olive grey, gravels are angular to subangular, wet, slight odor, slight sheen.	SW		30	26/50	2.5			
15		Well-graded SAND with gravel 75% sand 25% gravel, sand ranges from fine to coarse predominantly coarse, olive grey, gravels are angular to subangular, wet, slight odor, slight sheen.	SW		50	50	3.2			

Well Construction Information

Monument Type: Flush
Casing Diameter (inches): 2"
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 5-15

Filter Pack: 2/12 Lapis Luster Cemex Sand
Surface Seal: Asphalt
Annular Seal: Bentonite chips & concrete

Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment: NA
Surveyed Location: X: Y:

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Log of Boring: MW4

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: T. Adams

Date/Time Started:	7/29/08 1345	**Sampler Type:**	D&M 18"
Date/Time Completed:	7/29/08 1418	**Drive Hammer (lbs.):**	
Equipment:	Mini Rae 2000 PID	**Depth of Water ATD (ft bgs):**	6.5
Drilling Company:	Cascade Drilling	**Total Boring Depth (ft bgs):**	16
Drilling Foreman:	Scott Krueger	**Total Well Depth (ft bgs):**	15
Drilling Method:	Hollow-Stem Auger		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0						NA	0.0			
		Well-graded SAND 90% sand 10% gravel, sand ranges from fine to coarse predominantly coarse, light brown, gravels are subangular, dry, no odor, no sheen.	SW		100	4/2/4	3.1			
5		Well-graded SAND with gravel 65% sand 35% gravel, sand ranges from fine to coarse predominantly coarse, olive grey, gravels are angular to subangular, wet, no odor, no sheen.	SW		50	22/25/20	1.7	MW4-5-072908	X	
		Well-graded SAND with gravel 80% sand 20% gravel, sand grades from fine to coarse predominantly coarse, olive grey, gravels are angular to subangular, saturated, slight odor, slight sheen.	SW		30	50	1.4			
10		Well-graded SAND 100% sand, sand ranges from fine to coarse predominantly coarse, olive grey, wet, no odor, no sheen.	SW		20	20/23/28	3.8	MW4-080608	X	
		Well-graded SAND 90% sand, 10% silt, sand ranges from fine to coarse predominantly coarse, olive grey, wet, no odor, no sheen.	SW		10	25/30/32	2.6			
15		Well-graded SAND 90% sand, 10% silt, sand ranges from fine to coarse predominantly coarse, olive grey, wet, no odor, no sheen.	SW		50	50	1.8			

Well Construction Information

Monument Type: Flush
Casing Diameter (inches): 2"
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 5-15

Filter Pack: 2/12 Lapis Luster Cemex Sand
Surface Seal: Asphalt
Annular Seal: Bentonite chips & concrete

Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment: NA
Surveyed Location: X: Y:

TRC Environmental
19874 141st Place NE
Woodinville, WA 98072
(425) 489-1938

State of Washington
3270
Licensed Geologist
Amanda Helen Meugniot

MONITORING WELL LOG

BOREHOLE NUMBER: **MW-5**

PROJECT NUMBER / NAME: **318140 / BNSF John Michael Lease Site**

APPROVED BY: **Keith Woodburne, LG**

DRILLING CONTRACTOR / DRILLER: **Holocene / Zach Bailey**

LOGGED BY: **A. Meugniot**

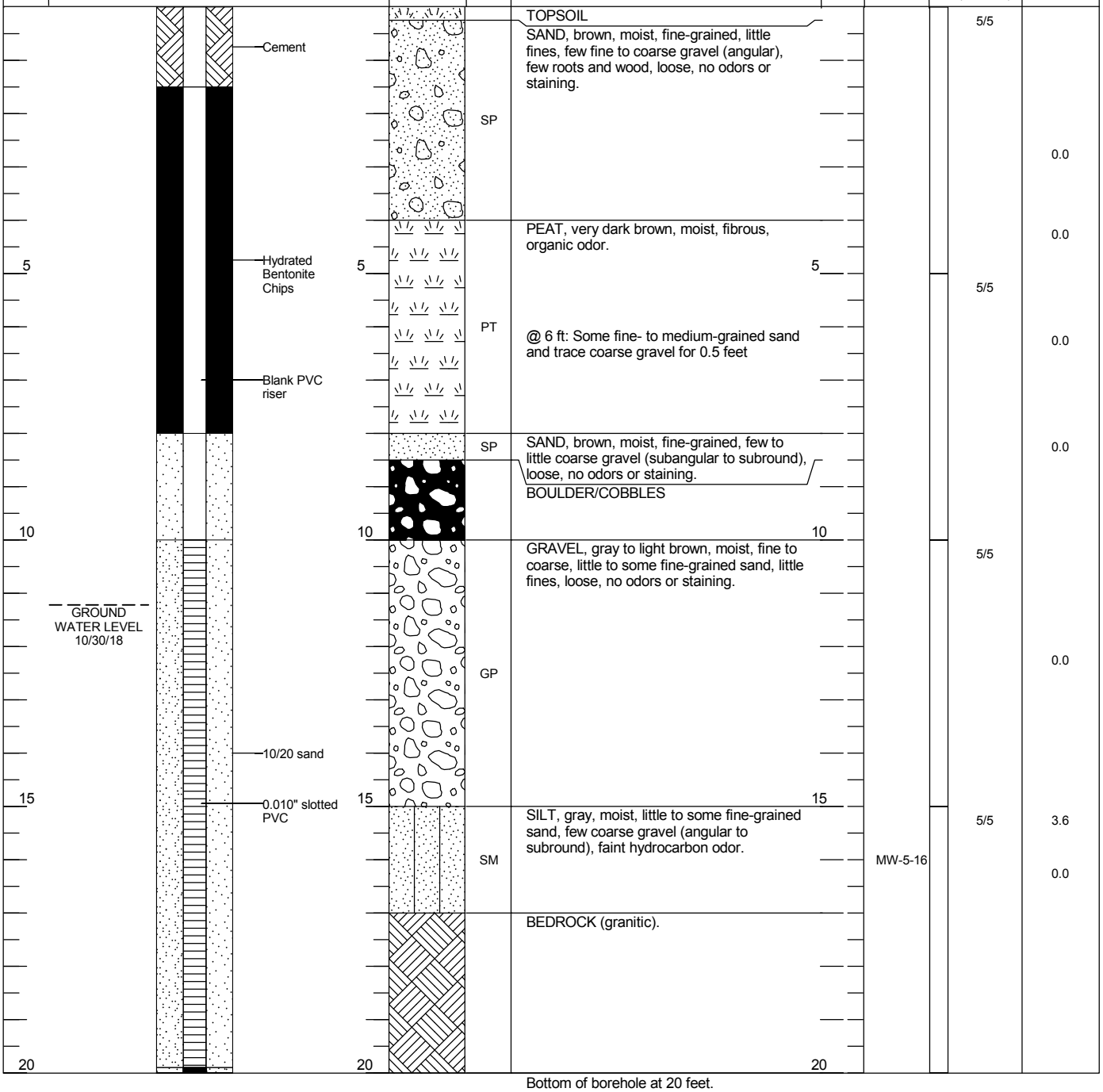
DRILLING EQUIPMENT / METHOD: **8140 LC / Sonic**

BIT SIZE / BIT TYPE: **4" / Sonic**

SAMPLING METHOD: **Continuous**

START-FINISH DATE: **10/29/18 - 10/29/18**

LOCATION: **Adjacent to 5640 Sunset Hwy Cashmere, WA**



Bottom of borehole at 20 feet.

SOIL BORING LOG - LOG A EWNN08.GDT - 12/21/18 11:26 - C:\USERS\AMEUGNIOT.EMPLOYEES\DESKTOP\BNSF JML REPORT\BNSF JML MWS.GPJ

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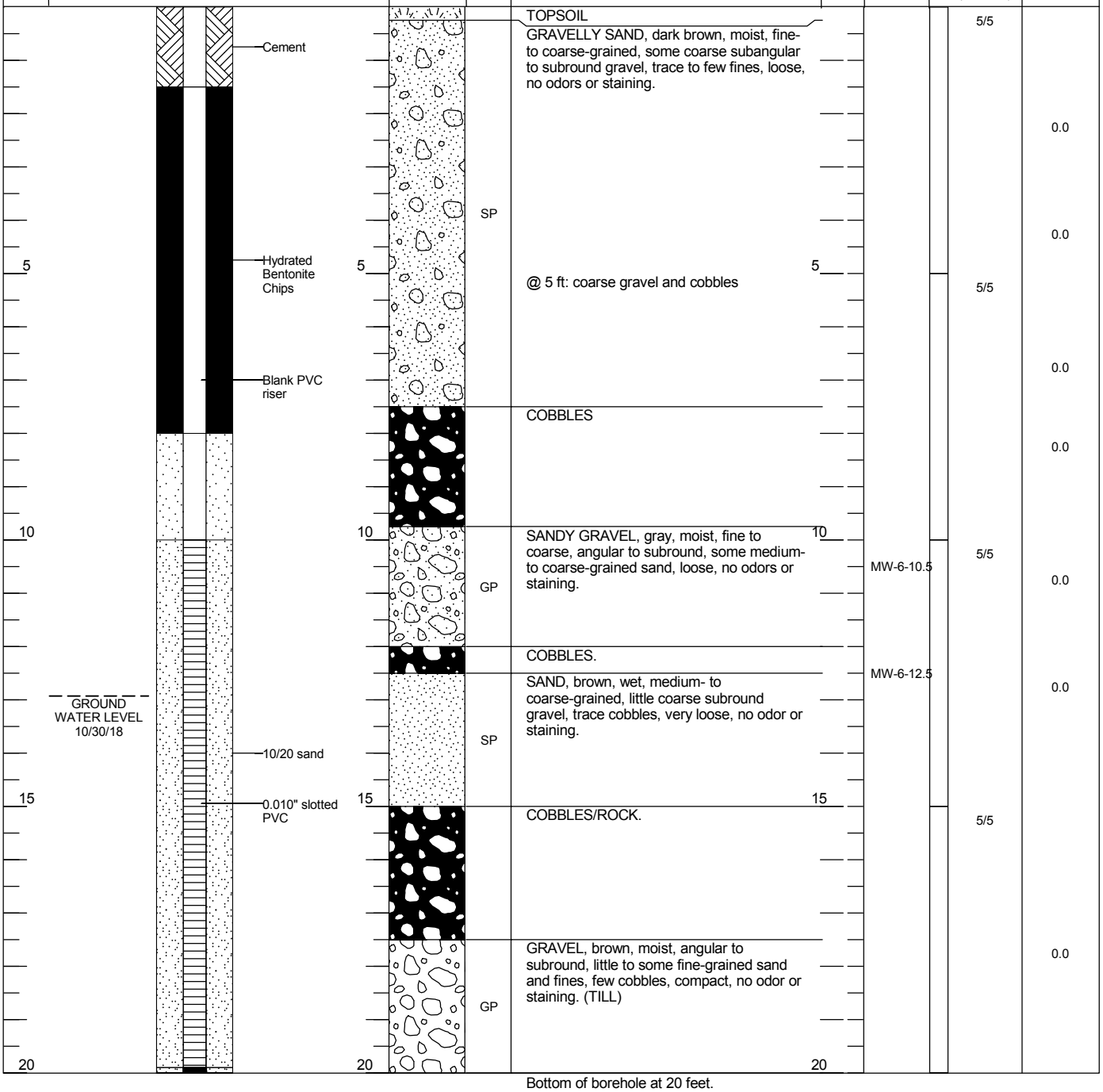
MONITORING WELL LOG

BOREHOLE NUMBER	**MW-6**
PROJECT NUMBER / NAME	**318140 / BNSF John Michael Lease Site**
APPROVED BY	**Keith Woodburne, LG**
DRILLING CONTRACTOR / DRILLER	**Holocene / Zach Bailey**
LOGGED BY	**A. Meugniot**
DRILLING EQUIPMENT / METHOD	**8140 LC / Sonic**
BIT SIZE / BIT TYPE	**4" / Sonic**
SAMPLING METHOD	**Continuous**
START-FINISH DATE	**10/29/18 - 10/29/18**
LOCATION	**Adjacent to 5640 Sunset Hwy Cashmere, WA**



Depth (feet)	Visual Description	USCS	Sample Number	Core Recovery (feet/feet)	PID Reading (ppm)
0	TOPSOIL			5/5	
	GRAVELLY SAND, dark brown, moist, fine- to coarse-grained, some coarse subangular to subround gravel, trace to few fines, loose, no odors or staining.	SP			0.0
5	@ 5 ft: coarse gravel and cobbles			5/5	0.0
	COBBLES				0.0
10	SANDY GRAVEL, gray, moist, fine to coarse, angular to subround, some medium- to coarse-grained sand, loose, no odors or staining.	GP	MW-6-10.5	5/5	0.0
	COBBLES.				
	SAND, brown, wet, medium- to coarse-grained, little coarse subround gravel, trace cobbles, very loose, no odor or staining.	SP	MW-6-12.5		0.0
15	COBBLES/ROCK.			5/5	
	GRAVEL, brown, moist, angular to subround, little to some fine-grained sand and fines, few cobbles, compact, no odor or staining. (TILL)	GP			0.0
20	Bottom of borehole at 20 feet.				

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MONITORING WELL LOG

BOREHOLE NUMBER: **MW-7**

PROJECT NUMBER / NAME: **318140 / BNSF John Michael Lease Site**

APPROVED BY: **Keith Woodburne, LG**

DRILLING CONTRACTOR / DRILLER: **Holocene / Zach Bailey**

LOGGED BY: **A. Meugniot**

DRILLING EQUIPMENT / METHOD: **8140 LC / Sonic**

BIT SIZE / BIT TYPE: **4' / Sonic**

SAMPLING METHOD: **Continuous**

START-FINISH DATE: **10/30/18 - 10/30/18**

LOCATION: **Adjacent to 5640 Sunset Hwy, Cashmere, WA**

State of Washington
3270
Licensed Geologist
Amanda Helen Meugniot

Depth (feet)	Temporary Well Completion Details	Graphic Log	USCS	Visual Description	Depth (feet)	Sample Number	Core Recovery (feet/feet)	PID Reading (ppm)
	Cement		GP	GRAVEL, brown, moist, fine to coarse, angular to subangular, little fine- to medium-grained sand, few fines, loose, no odors or staining.			5/5	0.0
	Hydrated Bentonite Chips							
	Blank PVC riser			GRAVEL with COBBLES, gray, moist, coarse, angular to subangular, few fines, no odor or staining.				0.0
5	10/20 sand	5	GP		5		2.5/2.5	
				COBBLES.			2.5/2.5	40.5
	GROUND WATER LEVEL 10/30/18			GRAVEL, gray, moist, coarse, angular to subangular, few cobbles, few fines, slight hydrocarbon odor, gray/black staining.				
10	0.010" slotted PVC	10	GP		10	MW-7-10	5/5	51.3
				BEDROCK (granitic).		MW-7-12		0.0
15		15		Bottom of borehole at 15 feet.	15			

SOIL BORING LOG - LOG A EWNN08.GDT - 12/21/18 11:26 - C:\USERS\AMEUGNIOT.EMPLOYEES\DESKTOP\BNSF JML REPORT\BNSF JML MWS.GPJ

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Log of Boring: T-1

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: J. Ruark

Date/Time Started:	5/06/08 1250	**Sampler Type:**	5035 and bucket
Date/Time Completed:	5/06/08 1430	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	9.5
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	9.5
Drilling Foreman:	Stacey Tolbert	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Silty SAND (85% sand, 10% silt, 5% gravel), fine- to medium-grained sand, grey, moist, slight odor.	SP-SM				10.7			
		Silty SAND (90% sand, 5% silt, 5% gravel), medium-grained sand, brown, moist, no odor.	SP				1.6	T1-050608-2-SW		
5		Silty SAND (90% sand, 5% silt, 5% gravel), medium-grained sand, brown, moist, no odor.	SP				2.6	T1-050608-4-NE		
		Silty SAND (90% sand, 5% silt, 5% gravel), medium-grained sand, brown, moist, no odor.	SP				1.3	T1-050608-6-NE		
10							2.4	T1-050608-8-SW T1-050608-8-NE	X X	

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: T-2

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: J. Ruark

Date/Time Started:	5/06/08 1440	**Sampler Type:**	5035 and bucket
Date/Time Completed:	5/06/08 1620	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	9.5
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	9.5
Drilling Foreman:	Stacey Tolbert	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Silty SAND (85% sand, 10% silt, 5% gravel), fine- to medium-grained sand, brown, moist, no odor.	SP-SM				1.4			
		Silty SAND (85% sand, 10% silt, 5% gravel), fine- to medium-grained sand, brown, moist, slight odor.	SP-SM				1.2	T2-050608-2-SW		
5		Sandy GRAVEL (90% gravel, 10% sand), medium- to coarse-grained sand, grey, moist, odor.	GP				2.3	T2-050608-4-SW		
		Sandy GRAVEL (85% gravel, 10% sand, 5% silt), medium-grained sand, grey to brown, moist, slight odor.	GP				1.7	T2-050608-6-NE		
10							0.0	T2-050608-8-SW T2-050608-8-NE	X X	

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Issaquah, Washington 98027

Log of Boring: T-3

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: J. Ruark

Date/Time Started:	5/07/08 0820	**Sampler Type:**	5035 and bucket
Date/Time Completed:	5/07/08 1010	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	8.5
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8.5
Drilling Foreman:	Stacey Tolbert	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Silty SAND (90% sand, 10% silt), fine- to medium-grained sand, brown, moist, no odor.	SP-SM				0.0			
		Silty SAND (90% sand, 10% silt), fine- to medium-grained sand, brown, moist, no odor.	SP-SM				0.0	T3-050708-2-C		
		Silty SAND (90% sand, 5% silt, 5% gravel), medium-grained sand, brown, moist, no odor.	SP				0.0	T3-050708-4-NE		
5		Silty SAND (90% sand, 5% silt, 5% gravel), medium-grained sand, brown, moist, no odor.	SP				0.0	T3-050708-6-SW		
							5.1	T3-050708-8-SW T3-050708-8-NE	X X	

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: T4

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA
Farallon PN: 683-018
Logged By: J. Ruark

Date/Time Started:	5/7/08 1015	**Sampler Type:**	5035 and bucket
Date/Time Completed:	5/7/08 1200	**Drive Hammer (lbs.):**	NA
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	8
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8
Drilling Foreman:	Stacey Tolbert	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Silty SAND (90% sand, 5% silt, 5% gravel), fine- to medium-grained sand, brown, moist, no odor.	SP				0.0			
		Silty SAND (90% sand, 5% silt, 5% gravel), fine- to medium-grained sand, brown, moist, no odor.	SP				0.0	T4-050708-2-S		
		SAND with gravel (90% sand, 10% gravel), medium- to coarse-grained sand, black/brown, moist, strong odor.	SP				1.3	T4-050708-4-N		
5		Gravelly SAND (85% sand, 10% silt, 5% gravel) medium- to coarse-grained sand, black, moist, strong odor, sheen.	SP-SM				12.7	T4-050708-6-N		
							19.6	T4-050708-8-S T4-050708-8-N	X X	
10										

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA
Filter Pack: NA
Surface Seal: NA
Annular Seal: NA
Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

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Log of Boring: T-5

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA
Farallon PN: 683-018
Logged By: J. Ruark

Date/Time Started: 5/6/08 1010
Date/Time Completed: 5/6/08 120
Equipment: DEere 310G
Drilling Company: Glacier Environmental
Drilling Foreman: Stacey Tolbert
Drilling Method: Backhoe

Sampler Type: 5035 and bucket
Drive Hammer (lbs.): NA
Depth of Water ATD (ft bgs): 9
Total Boring Depth (ft bgs): 9
Total Well Depth (ft bgs): NA

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Silty SAND (85% sand, 10% silt, 5% gravel, cobbles) fine- to medium-grained sand, brown to grey, moist, no odor.	SP-SM				0.0			
		Silty SAND (85% sand, 10% silt, 5% gravel) fine- to medium-grained sand, brown, moist, no odor.	SP-SM				0.1	T5-050608-2-C		
		SAND with gravel (85% sand, 10% gravel, 5% silt) medium- to coarse-grained sand, grey, moist, odor.	SP				0.7	T5-050608-4-SW		
5		SAND with gravel (85% sand, 10% gravel, 5% silt) medium- to coarse-grained sand, grey, moist, odor.	SP				0.0	T5-050608-6-C		
							0.0	T5-050608-8-NE T5-050608-8-SW T5-050608-8-W	X X X	

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA
Filter Pack: NA
Surface Seal: NA
Annular Seal: NA
Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

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Log of Boring: T-6

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: J. Ruark

Date/Time Started:	05/07/08 1245	**Sampler Type:**	5035 and bucket
Date/Time Completed:	05/07/08 1420	**Drive Hammer (lbs.):**	NA
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	10.5
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	10.5
Drilling Foreman:	Stacey Tobert	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Silty SAND (85% sand, 10% silt, 5% gravel) fine- to medium-grained sand, brown, moist, no odor.	SP-SM				0.2			
		Silty SAND (85% sand, 5% silt, 10% gravel) medium-grained sand, brown, moist, no odor, concrete observed in soil.	SP				0.0	T6-050708-2-N		
5		Gravelly SAND (85% sand, 15% gravel) medium- to coarse-grained sand, brown, moist, no odor.	SP				0.0	T6-050708-4-S		
		Gravelly SAND (80% sand, 15% gravel, 5% silt) medium- to coarse-grained sand, black, moist, strong odor, sticky tar-like substance observed.	SP				57.8	T6-050708-6-N		
		Gravelly SAND (80% sand, 15% gravel, 5% silt) medium- to coarse-grained sand, black, moist, strong odor, sticky tar-like substance observed.	SP				32.5	T6-050708-8-S	X	
10								T6-050708-10-N	X	

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

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Log of Boring: T-7

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: J. Ruark

Date/Time Started:	05/08/08 0900	**Sampler Type:**	5035 and bucket
Date/Time Completed:	05/08/08 1050	**Drive Hammer (lbs.):**	NA
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	10
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	10
Drilling Foreman:	Stacey Tolbert	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Silty SAND (85% sand, 10% silt, 5% gravel) fine- to medium-grained sand, brown, moist, no odor.	SP-SM				0.0			
		Silty SAND (85% sand, 10% silt, 5% gravel) medium- to coarse-grained sand, brown, moist, slight odor.	SP-SM				1.7	T7-050808-2-S		
5		SAND with gravel (85% sand, 10% gravel, 5% silt) medium- to coarse-grained sand, brown, moist, slight odor.	SP				0.0	T7-050808-4-N		
		SAND with gravel (75% sand, 25% gravel) medium- to coarse-grained sand, black, moist, strong odor	SP				61.8	T7-050808-6-S		
10							16.8	T7-050808-8-S T7-050808-8-N	X X	

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA

Filter Pack: NA
Surface Seal: NA
Annular Seal: NA

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

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Log of Boring: T-8

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA
Farallon PN: 683-018
Logged By: J. Ruark

Date/Time Started:	0508/08 1100	**Sampler Type:**	5035 and bucket
Date/Time Completed:	05/08/0/ 1220	**Drive Hammer (lbs.):**	NA
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	6.5
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	6.5
Drilling Foreman:	Stacey Tolbert	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Silty SAND (85% sand, 15% silt) fine- to medium-grained sand, brown moist, no odor.	SM				0.9			
		Silty SAND (80% sand, 20% silt) fine-grained sand, brown, moist, no odor.	SM				0.3	T8-050808-2-SW		
		Gravelly SAND (85% sand, 15% gravel) medium- to coarse-grained sand, grey, moist, no odor.	SP				0.0	T8-050808-4-NE		
5							0.0	T8-050808-6-SW T8-050808-6-NE	X X	

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA
Filter Pack: NA
Surface Seal: NA
Annular Seal: NA
Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

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Log of Boring: TP1

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA
Farallon PN: 683-018
Logged By: Jon Peterson

Date/Time Started:	9/20/07 0900	**Sampler Type:**	5035 and bucket
Date/Time Completed:	9/20/07 1000	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	NA
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8
Drilling Foreman:	Randy Bevin	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Fill- medium sand and concrete cobbles and boulders (50%/50%), gray and brown, loose, dry, no odor, no sheen.	SP				15.1	TP1-092007-0-2 @0920	X	
		Fill- medium sand and concrete cobbles and boulders (50%/50%), gray and brown, loose, dry, no odor, no sheen.	SP				4.9	TP1-092007-2-4 @0928		
5		Fill- medium sand and concrete cobbles and boulders (50%/50%), gray and brown, loose, dry, petroleum odor at oily stripe near 6 feet bgs, sheen.	SP				4.1	TP1-092007-4-6 @0940		
		Fill- medium sand and concrete cobbles and boulders (50%/50%), gray and brown, loose, moist, strong petroleum odor, free product observed.	SP				18.1	TP1-092007-6-8 @0955	X	
10										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP2

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: Jon Peterson

Date/Time Started:	9/20/07 1045	**Sampler Type:**	5035 and bucket
Date/Time Completed:	9/20/07 1200	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	NA
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8
Drilling Foreman:	Randy Bevin	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Fill- medium sand and gravel with cobbles and boulders (34%/33%/33%), gray and tan, loose, dry, heating oil-type odor, slight sheen.	SP				0	TP2-092007-0-2 @1100		
		Fill- medium sand and gravel with cobbles and boulders (34%/33%/33%), gray and tan, loose, dry, heating oil-type odor, slight sheen.	SP				0	TP2-092007-2-4 @1110	X	
		Fill- medium sand and gravel with cobbles and boulders (34%/33%/33%), gray and tan, loose, dry, tar-type odor, no sheen. Tar- type substance increases (downward) toward 6' bgs.	SP				0.1	TP2-092007-4-6 @1145		
5		Fill- medium sand and gravel with cobbles and boulders (34%/33%/33%), gray and tan, loose, dry, strong odor, black tar, sheen.	SP				0	TP2-092007-6-8 @1200	X	
10										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP3

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: Jon Peterson

Date/Time Started:	9/20/07 1230	**Sampler Type:**	5035 and bucket
Date/Time Completed:	9/20/07 1300	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	NA
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8
Drilling Foreman:	Randy Bevin	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Poorly graded medium sand with coarse gravel (60%/25%/15%), subrounded gravel, brown, loose, dry, faint odor, no sheen.	SP				0	TP3-092007-0-2 @1240		
		Poorly graded medium sand with coarse gravel (60%/25%/15%), subrounded gravel, brown, loose, dry, faint odor, no sheen.	SP				0	TP3-092007-2-4 @1245	X	
5		Poorly graded medium sand with coarse gravel (60%/25%/15%), subrounded gravel, brown, loose, dry, faint odor, no sheen. Some tar towards 6' bgs.	SP				0.5	TP3-092007-4-6 @1250	X	
		Tar and poorly graded coarse gravel with construction debris (60%/25%/15%), black to gray, sticky, moist, strong odor, sheen.	GP				30.6	TP3-092007-6-8 @1300		
10										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP4

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: Jon Peterson

Date/Time Started:	9/20/07 1330	**Sampler Type:**	5035 and bucket
Date/Time Completed:	9/20/07 1405	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	NA
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8
Drilling Foreman:	Randy Bevin	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Poorly graded medium sand with coarse gravel (60%/30%), brown, loose, dry, no odor, no sheen, rounded 4" cobble.	SP				0	TP4-092007-0-2 @1315		
		Poorly graded medium sand with coarse gravel (60%/30%), brown, loose, dry, no odor, no sheen, rounded 4" cobble.	SP				0	TP4-092007-2-4 @1320		
		Poorly graded medium sand with coarse gravel (60%/30%), brown, loose, dry, slight odor, no sheen, rounded 4" cobble.	SP				1.9	TP4-092007-4-6 @1325	X	
5		Poorly graded medium sand with coarse gravel (60%/30%), brown, loose, dry, slight odor, no sheen, rounded 4" cobble.	SP				0	TP4-092007-6-8 @1330	X	
		Poorly graded medium sand with coarse gravel (60%/30%) gray, loose, moist, odor, sheen.	SP							
10										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP5

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA
Farallon PN: 683-018
Logged By: Jon Peterson

Date/Time Started:	9/20/07 1400	**Sampler Type:**	5035 and bucket
Date/Time Completed:	9/20/07 1440	**Drive Hammer (lbs.):**	NA
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	NA
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8
Drilling Foreman:	Randy Bevin	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Poorly graded medium sand with coarse gravel (75%/25%), brown, loose, dry, no odor, no sheen. Cobble greater than 4" in diameter.	SP				0	TP5-092007-0-2 @1415		
		Poorly graded medium sand with coarse gravel (75%/25%), brown, loose, dry, no odor, no sheen. Cobble greater than 4" in diameter.	SP				0	TP5-092007-2-4 @1420	X	
		Poorly graded medium sand with coarse gravel (75%/25%), brown, loose, dry, no odor, no sheen. Cobble greater than 4" in diameter.	SP				0.1	TP5-092007-4-6 @1430		
5		Poorly graded medium sand with coarse gravel (75%/25%), brown, loose, dry, no odor, no sheen. Cobble greater than 4" in diameter.	SP				0	TP5-092007-6-8 @1435	X	
		Silty sand (55%/45%), medium, gray, loose, moist, odor, sheen. There is also contamination in the form of gray petroleum product that saturates pockets of sand.	SM							

Well Construction Information

Monument Type: NA
Casing Diameter (inches): NA
Screen Slot Size (inches): NA
Screened Interval (ft bgs): NA
Filter Pack: NA
Surface Seal: NA
Annular Seal: NA
Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: **X:** NA **Y:** NA

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Log of Boring: TP6

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: Jon Peterson

Date/Time Started:	9/20/07 1440	**Sampler Type:**	5035 and bucket
Date/Time Completed:	9/20/07 1520	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	NA
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8
Drilling Foreman:	Randy Bevin	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Poorly graded medium sand with coarse gravel (70%/25%), brown, medium dense, dry, no odor, no sheen. Cobble greater than 4" in diameter.	SP				0	TP6-092007-0-2 @1450		
		Poorly graded medium sand with coarse gravel (70%/25%), brown, medium dense, dry, no odor, no sheen. Cobble greater than 4" in diameter.	SP				0.1	TP6-092007-2-4 @1455		
		Poorly graded medium sand with coarse gravel (70%/25%), brown, medium dense, dry, no odor, no sheen. Cobble greater than 4" in diameter.	SP				0	TP6-092007-4-6 @1500	X	
5		Silty sand with coarse gravel (40%/40%/20%), medium, gray, loose, moist to wet, petroleum odor, sheen. Cobble is greater than 5" in diameter.	SM				0.2	TP6-092007-6-8 @1505	X	
10										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP7

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA
Farallon PN: 683-018
Logged By: Jon Peterson

Date/Time Started:	9/20/07 1520	**Sampler Type:**	5035 and bucket
Date/Time Completed:	9/20/07 1610	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	NA
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8
Drilling Foreman:	Randy Bevin	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Poorly graded medium sand with silt and coarse gravel (70%/15%/15%), tan, medium dense, dry, no odor, no sheen.	SP-SM				0	TP7-092007-0-2 @1530		
		Poorly graded medium sand with silt and coarse gravel (70%/15%/15%), tan, medium dense, dry, no odor, no sheen.	SP-SM				0	TP7-092007-2-4 @1535	X	
		Poorly graded medium sand with silt and coarse gravel (70%/15%/15%), tan, medium dense, dry, no odor, no sheen.	SP-SM				0	TP7-092007-4-6 @1545	X	
5		Gradual transition to sandy silt (50%/50%), medium sand, dark brown, loose, moist, petroleum odor, no sheen.	ML				0.1	TP7-092007-6-8 @1550		
10										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP8

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: Jon Peterson

Date/Time Started:	9/20/07 1615	**Sampler Type:**	5035 and bucket
Date/Time Completed:	9/20/07 1700	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	NA
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8
Drilling Foreman:	Randy Bevin	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Poorly graded fine sand with coarse gravel (70%/30%) highly organic, dark brown, loose, dry, slight odor, no sheen. 5" clasts to boulders.	SP				0.1	TP8-092007-0-2 @1625		
		Poorly graded fine sand with coarse gravel (70%/30%) highly organic, dark brown, loose, dry, slight odor, no sheen. 5" clasts to boulders.	SP				0.2	TP8-092007-2-4 @1630	X	
		Poorly graded fine sand with coarse gravel (70%/30%) highly organic, dark brown, loose, dry, slight odor, no sheen. 5" clasts to boulders.	SP				0.1	TP8-092007-4-6 @1640		
5		Poorly graded fine sand with coarse gravel (70%/30%) highly organic, dark brown, loose, dry, slight odor, no sheen. 5" clasts to boulders.	SP				0	TP8-092007-6-8 @1645	X	
10										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP9

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA
Farallon PN: 683-018
Logged By: Jon Peterson

Date/Time Started:	9/20/07 1700	**Sampler Type:**	5035 and bucket
Date/Time Completed:	9/20/07 1730	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	NA
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8
Drilling Foreman:	Randy Bevin	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Poorly graded coarse gravel with sand (75%/25%), brown, dense, dry, no odor, no sheen. Boulders.	GP				0.1	TP9-092007-0-2 @1710		
		Poorly graded medium sand with coarse gravel (75%/25%), rounded, organics, dark brown, loose, dry, no odor, no sheen.	SP							
		Poorly graded medium sand with coarse gravel (75%/25%), rounded, organics, dark brown, loose, dry, no odor, no sheen.	SP				0	TP9-092007-2-4 @1715	X	
		Poorly graded medium sand with coarse gravel (75%/25%), rounded, organics, dark brown, loose, dry, no odor, no sheen.	SP				0.5	TP9-092007-4-6 @1720		
5		Poorly graded medium sand with coarse gravel (75%/25%), rounded, organics, dark brown, loose, dry, faint odor, faint sheen.	SP				0.1	TP9-092007-6-8 @1725	X	
10										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP10

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: Jon Peterson

Date/Time Started:	9/20/07 1730	**Sampler Type:**	5035 and bucket
Date/Time Completed:	9/20/07 1800	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	NA
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8
Drilling Foreman:	Randy Bevin	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Poorly graded medium sand with coarse gravel (70%/30%), tan, dense, dry, no odor, no sheen.	SP				0	TP10-092007-0-2 @1740		
		Poorly graded medium sand with coarse gravel (70%/30%), tan, dense, dry, no odor, no sheen.	SP				0.1	TP10-092007-2-4 @1745	X	
		Poorly graded medium sand with coarse gravel (70%/30%), tan, dense, dry, no odor, no sheen.	SP				0.5	TP10-092007-4-6 @1750		
5		Silty sand with fine gravel (50%/30%/20%), medium, medium dense, moist, strong petroleum odor, sheen. Some gravel has an interstitial, tar-type matrix.	SM							
		Silty sand with fine gravel (50%/30%/20%), medium, medium dense, moist, strong petroleum odor, sheen. Some gravel has an interstitial, tar-type matrix.	SM				0.5	TP10-092007-6-8 @1755	X	
10										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP11

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA
Farallon PN: 683-018
Logged By: Jon Peterson

Date/Time Started:	9/20/07 1800	**Sampler Type:**	5035 and bucket
Date/Time Completed:	9/20/07 1840	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	NA
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8
Drilling Foreman:	Randy Bevin	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Silty sand with fine to coarse gravel (55%/30%/15%), medium, tan, dense, dry, no odor, no sheen. Gravel is subrounded.	SM				0	TP11-092007-0-2 @1810		
		Silty sand with fine to coarse gravel (55%/30%/15%), medium, tan, dense, dry, no odor, no sheen. Gravel is subrounded.	SM				0	TP11-092007-2-4 @1815	X	
		Silty sand with fine to coarse gravel (55%/30%/15%), medium, tan, dense, dry, no odor, no sheen. Gravel is subrounded.	SM							
5		Silty sand with fine to coarse gravel (55%/30%/15%), medium, tan, dense, moist, petroleum odor, sheen. Free product observed, tar stains left on sampling equipment.	SM				0.5	TP11-092007-4-6 @1820	X	
		Silty sand with fine to coarse gravel (55%/30%/15%), medium, tan, dense, moist, petroleum odor, sheen. Free product observed, tar stains left on sampling equipment.	SM				35.8	TP11-092007-6-8 @1825		
10										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP12

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: Jon Peterson

Date/Time Started:	9/21/07 0630	**Sampler Type:**	5035 and bucket
Date/Time Completed:	9/21/07 1715	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	NA
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8
Drilling Foreman:	Randy Bevin	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Poorly graded medium sand with coarse gravel (70%/30%), tan, med.dense, dry, slight odor, no sheen. Boulders present.	SP				0	TP12-092107-0-2 @0640		
		Poorly graded medium sand with coarse gravel (70%/30%), tan, med.dense, dry, slight odor, no sheen. Boulders present.	SP				0	TP12-092107-2-4 @0645		
		Poorly graded medium sand with coarse gravel (70%/30%), gray, loose, moist, strong odor, sheen.	SP				0	TP12-092107-4-6 @0650	X	
5		Poorly graded medium sand with coarse gravel (70%/30%), gray, loose, moist, very strong odor, sheen.	SP				51.3	TP12-092107-6-8 @0655	X	
10										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP13

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: Jon Peterson

Date/Time Started:	9/21/07 0730	**Sampler Type:**	5035 and bucket
Date/Time Completed:	9/21/07 0800	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	7
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	7.5
Drilling Foreman:	Randy Bevin	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Fill - Medium sand with coarse gravel and bricks and other construction debris (60%/25%/15%), tan, loose, dry, no odor, no sheen. Abundant river rock: subrounded 3" gravel.	SP				0	TP13-092107-0-2 @0740	X	
		Fill - Medium sand with coarse gravel and bricks and other construction debris (60%/25%/15%), tan, loose, dry, no odor, no sheen. Abundant river rock: subrounded 3" gravel.	SP				0.1	TP13-092107-2-4 @0745		
5		Fill - Medium sand with coarse gravel and bricks and other construction debris (60%/25%/15%), tan, loose, dry, no odor, no sheen. Abundant river rock: subrounded 3" gravel.	SP				0	TP13-092107-4-6 @0750		
		Fill - Medium sand with coarse gravel and bricks and other construction debris (60%/25%/15%), tan, loose, wet below 7' bgs, no odor, no sheen. Abundant river rock: subrounded 3" gravel.	SP				0.2	TP13-092107-6-8 @0755	X	
10										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP14

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: Jon Peterson

Date/Time Started:	9/21/07 0815	**Sampler Type:**	5035 and bucket
Date/Time Completed:	9/21/07 0900	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	8
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8
Drilling Foreman:	Randy Bevin	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Fill - Medium sand with coarse gravel and bricks and other construction debris (60%/25%/15%), tan, loose, dry, no odor, no sheen. Abundant river rock: subrounded 3" gravel.	SP				0	TP14-092107-0-2 @0815		
		Fill - Medium sand with coarse gravel and bricks and other construction debris (60%/25%/15%), tan, loose, dry, no odor, no sheen. Abundant river rock: subrounded 3" gravel.	SP				0.1	TP14-092107-2-4 @0820		
5		Fill - Medium sand with coarse gravel and bricks and other construction debris (60%/25%/15%), tan, loose, very moist, slight odor, no sheen. Abundant river rock: subrounded 3" gravel.	SP				NA	TP14-092107-4-6 @0835	X	
		Fill - Medium sand with coarse gravel and bricks and other construction debris (60%/25%/15%), tan, loose, wet (water at 8' bgs), slight odor, no sheen. Abundant river rock: subrounded 3" gravel.	SP				NA	TP14-092107-6-8 @0840	X	
10										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP15

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: Jon Peterson

Date/Time Started:	9/21/07 0900	**Sampler Type:**	5035 and bucket
Date/Time Completed:	9/21/07 0950	**Drive Hammer (lbs.):**	
Equipment:	Deere 310G	**Depth of Water ATD (ft bgs):**	8
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	8
Drilling Foreman:	Randy Bevin	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Fill - Medium sand with coarse gravel and bricks and other construction debris (60%/25%/15%), tan, medium dense, dry, no odor, no sheen.	SP				0.1	TP15-092107-0-2 @0910	X	
		Fill - Medium sand with coarse gravel and bricks and other construction debris (60%/25%/15%), tan, medium dense, dry, no odor, no sheen.	SP				0	TP15-092107-2-4 @0915		
5		Fill - Medium sand with coarse gravel and bricks and other construction debris (60%/25%/15%), tan, medium dense, dry, no odor, no sheen.	SP				0.1	TP15-092107-4-6 @0920	X	
		Fill - Medium sand with coarse gravel and bricks and other construction debris (60%/25%/15%), tan, medium dense, wet at 8' bgs, no odor, no sheen.	SP				0	TP15-092107-6-8 @0925		
10										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP20

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: Javan Ruark

Date/Time Started:	4/6/09 1005	**Sampler Type:**	Bucket
Date/Time Completed:	4/6/09 1114	**Drive Hammer (lbs.):**	
Equipment:	Excavator	**Depth of Water ATD (ft bgs):**	14
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	14
Drilling Foreman:	Chris Eriksson	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Poorly graded SAND with Gravel (70% sand, 25% gravel, 5% silt), medium grained sand, medium to coarse gravel, brown, moist, no odor.	SP							
		Poorly graded SAND with Gravel (70% sand, 25% gravel, 5% silt), medium grained sand, medium to coarse gravel, grey, moist, no odor.	SP				0.1	TP-20-2 @1010		
		Poorly graded SAND with Gravel (70% sand, 25% gravel, 5% silt), medium grained sand, medium to coarse gravel, black staining, moist, slight odor.	SP				0.0	TP-20-4 @1015		
5		Fill - Medium sand with coarse gravel and bricks and other construction debris (60%/25%/15%), tan, medium dense, wet at 8' bgs, no odor, no sheen.	SP				0.0	TP-20-6 @1020		
		Poorly graded SAND with Silt (85% sand, 10% silt, 5% gravel), fine to medium grained sand, medium gravel, grey to black, moist, slight odor.	SP-SM				0.0	TP-20-8 @1025		
10		Poorly graded SAND with Silt (85% sand, 10% silt, 5% gravel), fine to medium grained sand, medium gravel, grey to black, moist, slight odor.	SP-SM				0.0	TP-20-10 @1028		
		Poorly graded SAND with Silt (85% sand, 10% silt, 5% gravel), fine to medium grained sand, medium gravel, grey to black, moist, slight odor.	SP-SM				0.0	TP-20-12 @1030		
							0.0	TP-20-14 @1050		

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP21

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 683-018

Logged By: Javan Ruark

Date/Time Started:	4/6/09 1115	**Sampler Type:**	Bucket
Date/Time Completed:	4/6/09 1240	**Drive Hammer (lbs.):**	
Equipment:	Excavator	**Depth of Water ATD (ft bgs):**	14
Drilling Company:	Glacier Environmental	**Total Boring Depth (ft bgs):**	14
Drilling Foreman:	Chris Eriksson	**Total Well Depth (ft bgs):**	NA
Drilling Method:	Backhoe		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Silty SAND (85% sand, 15% silt), fine grained sand, brown, mosit, no odor.	SP							
		Silty SAND (80% sand, 10% silt,	SP				0.0	TP-21-2 @1120		
		Poorly graded SAND with Gravel (70% sand, 25% gravel, 5% silt), medium grained sand, medium to coarse gravel, black staining, moist, slight odor.	SP				0.0	TP-21-4 @1142		
5		Fill - Medium sand with coarse gravel and bricks and other construction debris (60%/25%/15%), tan, medium dense, wet at 8' bgs, no odor, no sheen.	SP				0.0	TP-21-6 @11145		
		Poorly graded SAND with Silt (85% sand, 10% silt, 5% gravel), fine to medium grained sand, medium gravel, grey to black, moist, slight odor.	SP-SM				0.0	TP-21-8 @1205		
10		Poorly graded SAND with Silt (85% sand, 10% silt, 5% gravel), fine to medium grained sand, medium gravel, grey to black, moist, slight odor.	SP-SM				0.1	TP-21-10 @1210		
		Poorly graded SAND with Silt (85% sand, 10% silt, 5% gravel), fine to medium grained sand, medium gravel, grey to black, moist, slight odor.	SP-SM				0.1	TP-21-12 @1218		
							0.1	TP-21-13.5 @1230		

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring:

Client:
Project:
Location:

Farallon PN:

Logged By:

Date/Time Started:
Date/Time Completed:
Equipment:
Drilling Company:
Drilling Foreman:
Drilling Method:

Sampler Type:
Drive Hammer (lbs.):
Depth of Water ATD (ft bgs):
Total Boring Depth (ft bgs):
Total Well Depth (ft bgs):

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		SILT with Sand (75% silt, 25% sand), fine sand, brown, moist, no								
5		SILT with Sand (75% silt, 25% sand), fine sand, brown, moist, no odor.								
		SILT with Sand (75% silt, 25% sand), fine sand, brown, moist, no odor.								
		SILT with Sand (75% silt, 25% sand), fine sand, brown, moist, no								
10		SILT with Sand (75% silt, 25% sand), fine sand, brown, moist, no odor.								
		SILT with Sand (75% silt, 25% sand), fine sand, brown, moist, no odor.								
15										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):

Filter Pack:
Surface Seal:
Annular Seal:

Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP-23

Client: John Michael Lease
Project: BNSF Cashmere
Location: Cashmere, Washington

Farallon PN: 683-018

Logged By: Javan Ruark

Date/Time Started:	4/6/09 @ 1345	**Sampler Type:**	bucket
Date/Time Completed:	4/6/09 @ 1455	**Drive Hammer (lbs.):**	
Equipment:	Excavator	**Depth of Water ATD (ft bgs):**	14.5'
Drilling Company:	Glacier	**Total Boring Depth (ft bgs):**	14.5'
Drilling Foreman:	Chris Erickson	**Total Well Depth (ft bgs):**	N/A
Drilling Method:	N/A		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		SILT with Sand (80% silt, 20% sand), fine sand, dark brown, moist, no			100	N/A	0.0	TP-23-2		
		SILT with Sand (80% silt, 20% sand), fine sand, dark brown, moist, no odor.	ML		100	N/A	0.0	TP-23-4		
5		SILT with Sand (85% silt, 15% sand), fine sand, brown, moist, no odor.			100	N/A	0.3	TP-23-6		
		SILT with Sand (85% silt, 15% sand), fine sand, brown, moist, no			100	N/A	0.0	TP-23-8		
10		Poorly-graded SAND with gravel (80% sand, 15% gravel, 5% silt), medium to coarse sand, fine gravel, gray-brown, moist, no odor.	SP		100	N/A	0.0	TP-23-10		
		Poorly-graded SAND with gravel (80% sand, 15% gravel, 5% silt), medium to coarse sand, fine gravel, gray-brown, moist, no odor.			100	N/A	0.1	TP-23-12		
		Poorly-graded SAND with gravel (85% sand, 10% gravel, 5% silt), medium to coarse sand, fine gravel, gray-brown, moist, no odor.	SP		100	N/A	0.0	TP-23-14	X	
15										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP-24

Client: John Michael Lease
Project: BNSF Cashmere
Location: Cashmere, Washington

Farallon PN: 683-018

Logged By: Javan Ruark

Date/Time Started:	4/6/09 @ 1500	**Sampler Type:**	bucket
Date/Time Completed:	4/6/09 @ 1550	**Drive Hammer (lbs.):**	
Equipment:	Excavator	**Depth of Water ATD (ft bgs):**	14.5'
Drilling Company:	Glacier	**Total Boring Depth (ft bgs):**	14'
Drilling Foreman:	Chris Erickson	**Total Well Depth (ft bgs):**	N/A
Drilling Method:	N/A		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		SILT with Sand (80% silt, 15% sand, 5% gravel), fine sand, fine			100	N/A	0.0	TP-24-2		
		SILT with Sand (80% silt, 15% sand, 5% gravel), fine sand, fine gravel, dark brown, moist, no odor.	ML		100	N/A	0.0	TP-24-4		
5		Silty SAND (80% sand, 15% silt, 5% gravel), fine to medium sand, fine gravel, gray-brown, moist, no odor.			100	N/A	0.0	TP-24-6		
					100	N/A	0.0	TP-24-8		
10		Poorly-graded SAND with gravel (80% sand, 15% gravel, 5% silt), medium sand, fine to coarse gravel, brown-gray, moist, no odor.	SP		100	N/A	0.0	TP-24-10		
		Poorly-graded SAND with gravel (80% sand, 15% gravel, 5% silt), medium sand, fine to coarse gravel, brown-gray, moist, no odor.			100	N/A	0.0	TP-24-12		
		Poorly-graded SAND with gravel (80% sand, 20% gravel), medium sand, fine to coarse gravel, brown-gray, moist, no odor.	SP		100	N/A	0.0	TP-24-14	X	
15										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP-25

Client: John Michael Lease
Project: BNSF Cashmere
Location: Cashmere, Washington

Farallon PN: 683-018

Logged By: Javan Ruark

Date/Time Started:	4/6/09 @ 1550	**Sampler Type:**	bucket
Date/Time Completed:	4/6/09 @ 1630	**Drive Hammer (lbs.):**	
Equipment:	Excavator	**Depth of Water ATD (ft bgs):**	14
Drilling Company:	Glacier	**Total Boring Depth (ft bgs):**	14.5
Drilling Foreman:	Chris Erickson	**Total Well Depth (ft bgs):**	N/A
Drilling Method:	N/A		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Silty SAND (80% sand, 15% silt, 5% gravel), fine sand, fine gravel,			100	N/A	0.0	TP-25-2		
		Silty SAND (80% sand, 15% silt, 5% gravel), fine sand, fine gravel, black, moist, no odor.	SM		100	N/A	0.0	TP-25-4		
5		Silty SAND (80% sand, 15% silt, 5% gravel), fine sand, fine gravel, black, moist, no odor.			100	N/A	0.0	TP-25-6		
		Silty SAND (85% sand, 15% silt), fine sand, fine gravel, brown-gray,			100	N/A	0.0	TP-25-8	X	
10		Silty SAND (85% sand, 15% silt), fine sand, black, moist, strong odor.	SM		100	N/A	45.3	TP-25-10		
		Poorly-graded SAND with gravel (80% sand, 15% gravel, 5% silt), medium sand, fine gravel, black, moist, strong odor, staining.			100	N/A	50.6	TP-25-12		
15		Silty SAND (85% sand, 15% silt), fine to medium sand, black, moist to wet, strong odor, staining.	SM		100	N/A	51.1	TP-25-14	X	

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP-26

Client: John Michael Lease
Project: BNSF Cashmere
Location: Cashmere, Washington

Farallon PN: 683-018

Logged By: Javan Ruark

Date/Time Started:	4/7/09 @ 748	**Sampler Type:**	bucket
Date/Time Completed:	4/7/09 @ 825	**Drive Hammer (lbs.):**	
Equipment:	Excavator	**Depth of Water ATD (ft bgs):**	16
Drilling Company:	Glacier	**Total Boring Depth (ft bgs):**	16
Drilling Foreman:	Chris Erickson	**Total Well Depth (ft bgs):**	N/A
Drilling Method:	N/A		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Poorly-graded SAND (95% sand, 5% silt), fine to medium sand,			100	N/A	0.1	TP-26-2		
		Poorly-graded SAND (95% sand, 5% silt), fine to medium sand, brown, moist, no odor.	SP		100	N/A	0.1	TP-26-4		
5					100	N/A	0.1	TP-26-6		
		Silty SAND (80% sand, 15% silt, 5% gravel), fine to medium sand, fine			100	N/A	0.1	TP-26-8		
10		SILT with Sand (75% silt, 25% sand), fine to medium sand, black, moist, no odor.	ML		100	N/A	0.0	TP-26-10	X	
					100	N/A	0.0	TP-26-12		
15										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring:

Client:
Project:
Location:

Farallon PN:

Logged By:

Date/Time Started:
Date/Time Completed:
Equipment:
Drilling Company:
Drilling Foreman:
Drilling Method:

Sampler Type:
Drive Hammer (lbs.):
Depth of Water ATD (ft bgs):
Total Boring Depth (ft bgs):
Total Well Depth (ft bgs):

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0										
		Poorly-graded SAND with Silt (80% sand, 10% silt, 10% gravel), fine sand, fine gravel, brown, moist, no odor.								
5		Sandy SILT (75% silt, 25% sand), fine sand, gray-dark gray, moist, no odor, wood debris.								
		Poorly-graded SAND with Silt (90% sand, 10% silt), fine sand, gray-								
10		Silty SAND (85% sand, 15% silt), fine sand, brown, moist, no odor.								
		Silty SAND (75% sand, 25% silt), fine sand, black, moist, strong odor, staining.								
		Silty SAND (75% sand, 20% silt, 5% gravel), fine sand, fine gravel, black, moist, strong odor, staining.								
15										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):

Filter Pack:
Surface Seal:
Annular Seal:

Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP-28

Client: John Michael Lease
Project: BNSF Cashmere
Location: Cashmere, Washington

Farallon PN: 683-018

Logged By: Javan Ruark

Date/Time Started:	4/7/09 @ 1115	**Sampler Type:**	bucket
Date/Time Completed:	4/7/09 @ 1138	**Drive Hammer (lbs.):**	
Equipment:	Excavator	**Depth of Water ATD (ft bgs):**	10
Drilling Company:	Glacier	**Total Boring Depth (ft bgs):**	10.2
Drilling Foreman:	Chris Erickson	**Total Well Depth (ft bgs):**	N/A
Drilling Method:	N/A		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Sandy SILT (70% silt, 20% sand, 10% gravel), fine sand, fine gravel,			100	N/A	1.1	TP-28-2		
5		Sandy SILT (70% silt, 20% sand, 10% gravel), fine sand, fine gravel, brown, moist, no odor.	ML		100	N/A	0.9	TP-28-4		
		Poorly-graded SAND with Silt (90% sand, 10% silt), fine to medium sand, brown, moist, no odor.			100	N/A	1.0	TP-28-6		
		Silty SAND (85% sand, 15% silt), medium sand, brown, moist, no			100	N/A	1.2	TP-28-8		
10		Silty SAND (80% sand, 15% silt, 5% gravel), medium sand, brown, wet, no odor.	SM		100	N/A	1.8	TP-28-10	X	
15										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Boring: TP-29

Client: John Michael Lease
Project: BNSF Cashmere
Location: Cashmere, Washington

Farallon PN: 683-018

Logged By: Javan Ruark

Date/Time Started:	4/7/09 @ 1142	**Sampler Type:**	bucket
Date/Time Completed:	4/7/09 @ 1210	**Drive Hammer (lbs.):**	
Equipment:	Excavator	**Depth of Water ATD (ft bgs):**	10
Drilling Company:	Glacier	**Total Boring Depth (ft bgs):**	10.2
Drilling Foreman:	Chris Erickson	**Total Well Depth (ft bgs):**	N/A
Drilling Method:	N/A		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Sandy SILT (80% silt, 20% sand), fine sand, gray-dark brown, moist,			100	N/A	1.6	TP-29-2		
		Sandy SILT (80% silt, 20% sand), fine sand, gray-dark brown, moist, no odor.	ML		100	N/A	1.9	TP-29-4		
5		Sandy SILT (80% silt, 20% sand), fine sand, gray-dark brown, moist, no odor.			100	N/A	2.8	TP-29-6		
		Sandy SILT (80% silt, 20% sand), fine sand, gray-dark brown, moist,			100	N/A	13.2	TP-29-8	X	
10		Poorly-graded SAND with gravel (80% sand, 15% gravel, 5% silt), medium to coarse sand, fine gravel, brown-gray, moist to wet, no odor.	SP		100	N/A	9.8	TP-29-10		
15										

Well Construction Information

Monument Type:
Casing Diameter (inches):
Screen Slot Size (inches):
Screened Interval (ft bgs):
Filter Pack:
Surface Seal:
Annular Seal:
Ground Surface Elevation (ft):
Top of Casing Elevation (ft):
Boring Abandonment:
Surveyed Location: **X:** **Y:**

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Log of Test Pit: TP30

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 283-006

Logged By: Jon Peterson

Date/Time Started: 06/25/12 1245
Date/Time Completed: 06/25/12 1400
Equipment: Backhoe
Excavation Company: Clear Creek
Excavation Foreman: Matt Clayton
Excavating Method: Backhoe

Sampler Type: Backhoe bucket
Depth of Water (ft bgs): 16
Total Excavation Depth (ft bgs): 16

Depth (feet bgs)	Sample Interval	Lithologic Description	USCS	USGS Graphic	PID (ppmv)	Sample ID	Sample Analyzed
0		0-8' bgs: Silty SAND (75% sand, 15% silt), fine to medium sand, brown, moist, no odor, observed glass, plastic, and metal debris.	SM		3.9	TP30-062512-2.0 @ 1300	
					0.0	TP30-062512-4.0 @ 1305	
5					0.0	TP30-062512-6.0 @ 1310	
		8-9' bgs: Well-graded GRAVEL with sand (60% gravel, 40% sand), fine to coarse gravel, fine to medium sand, brown, moist, no odor.	GW		0.0	TP30-062512-8.0 @ 1315	
		9-16' bgs: Silty SAND with gravel (50% sand, 30% gravel, 20% silt), fine to medium sand, fine to coarse gravel, gray to brown, moist to wet, odor, observed glass, plastic, and metal debris.	SM		0.0	TP30-062512-10.0 @ 1320	
10					0.0	TP30-062512-12.0 @ 1325	
					0.0	TP30-062512-14.0 @ 1330	X
15					0.2	TP30-062512-16.0 @ 1335	X

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Log of Test Pit: TP31

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA
Farallon PN: 283-006
Logged By: Jon Peterson

Date/Time Started: 06/25/12 1500
Date/Time Completed: 06/25/12 1620
Equipment: Backhoe
Excavation Company: Clear Creek
Excavation Foreman: Matt Clayton
Excavating Method: Backhoe

Sampler Type: Backhoe bucket
Depth of Water (ft bgs): 14
Total Excavation Depth (ft bgs): 18

Depth (feet bgs)	Sample Interval	Lithologic Description	USCS	USGS Graphic	PID (ppmv)	Sample ID	Sample Analyzed
0		0-7' bgs: Silty SAND with wood (80% sand, 20% silt), fine to medium sand, sparse boulders, brown, moist, no odor, metal debris.	SM				
					4.1	TP31-062512-2.0 @ 1505	
					7.5	TP31-062512-4.0 @ 1510	
5					2.9	TP31-062512-6.0 @ 1515	
		7-10' bgs: Well-graded SAND (100% sand), fine to coarse sand, tan, moist, no odor.	SW		2.8	TP31-062512-8.0 @ 1520	
10		10-18' bgs: Well-graded SAND with gravel (60% sand, 40% gravel), fine to coarse sand, fine to coarse gravel, tan, moist to wet, no odor.	SW		1.6	TP31-062512-10.0 @ 1525	
					0.4	TP31-062512-12.0 @ 1530	X
					0.0	TP31-062512-14.0 @ 1535	
15					0.0	TP31-062512-16.0 @ 1540	X
					0.0	TP31-062512-18.0 @ 1545	

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Log of Test Pit: TP32

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 283-006

Logged By: Jon Peterson

Date/Time Started: 06/26/12 0700
Date/Time Completed: 06/26/12 0930
Equipment: Backhoe
Excavation Company: Clear Creek
Excavation Foreman: Matt Clayton
Excavating Method: Backhoe

Sampler Type: Backhoe bucket
Depth of Water (ft bgs): 14
Total Excavation Depth (ft bgs): 16

Depth (feet bgs)	Sample Interval	Lithologic Description	USCS	USGS Graphic	PID (ppmv)	Sample ID	Sample Analyzed
0		0-7' bgs: Silty SAND with wood (80% sand, 20% silt), fine to medium sand, dark brown, dry, no odor, observed glass, plastic, wood, and metal debris.	SM				
					0.0	TP32-062612-2.0 @ 0710	
					0.0	TP32-062612-4.0 @ 0715	
5					0.1	TP32-062612-6.0 @ 0720	
		7-9' bgs: Poorly graded SAND (100% sand), fine to medium sand, tan, moist, no odor, observed railroad ballast.	SP				
					0.0	TP32-062612-8.0 @ 0725	
		9-16' bgs: Well-graded SANd with gravel (60% sand, 40% gravel), fine to coarse sand, fine to coarse gravel, gray, moist to wet, no odor, light sheen, no anthropogenic debris below 8' bgs.	SW				
10					0.0	TP32-062612-10.0 @ 0910	
					0.0	TP32-062612-12.0 @ 0915	X
					0.1	TP32-062612-14.0 @ 0920	
15							
					0.0	TP32-062612-16.0 @ 0925	X

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Log of Test Pit: TP33

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 283-006

Logged By: Jon Peterson

Date/Time Started: 06/25/12 1400
Date/Time Completed: 06/25/12 1500
Equipment: Backhoe
Excavation Company: Clear Creek
Excavation Foreman: Matt Clayton
Excavating Method: Backhoe

Sampler Type: Backhoe bucket
Depth of Water (ft bgs): 16
Total Excavation Depth (ft bgs): 18

Depth (feet bgs)	Sample Interval	Lithologic Description	USCS	USGS Graphic	PID (ppmv)	Sample ID	Sample Analyzed
0		0-12' bgs: Silty SAND with gravel (50% sand, 30% gravel, 20% silt), fine to medium sand, fine to coarse gravel, brown, moist, no odor, observed glass, plastic, and metal debris.	SM				
					1.8	TP33-062512-2.0 @ 1405	
					1.3	TP33-062512-4.0 @ 1410	
5					1.6	TP33-062512-6.0 @ 1415	
					0	TP33-062512-8.0 @ 1420	
10					3.9	TP33-062512-10.0 @ 1425	
		12-17' bgs: Silty SAND with gravel (50% sand, 35% gravel, 15% silt), fine to medium sand, fine to coarse gravel, gray to brown, moist to wet, faint odor increasing with depth, some black staining.	SM		17.9	TP33-062512-11.7 @ 1430	
					24.4	TP33-062512-14.0 @ 1435	X
15					24.5	TP33-062512-16.0 @ 1440	
		17-18' bgs: Silty SAND with gravel (50% sand, 30% gravel, 20% silt), fine to medium sand, fine to coarse gravel, gray to brown, moist, odor.	SM				
					42.7	TP33-062512-18.0 @ 1445	

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Log of Test Pit: TP34

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 283-006

Logged By: Jon Peterson

Date/Time Started: 06/25/12 1110
Date/Time Completed: 06/25/12 1245
Equipment: Backhoe
Excavation Company: Clear Creek
Excavation Foreman: Matt Clayton
Excavating Method: Backhoe

Sampler Type: Backhoe bucket
Depth of Water (ft bgs): 15.5
Total Excavation Depth (ft bgs): 16

Depth (feet bgs)	Sample Interval	Lithologic Description	USCS	USGS Graphic	PID (ppmv)	Sample ID	Sample Analyzed
0		0-8' bgs: Silty SAND with wood (80% sand, 20% silt), fine to medium sand, brown, dry, no odor, no sheen, observed plastic and metal debris.	SM		12.1	TP34-062512-2.0 @ 1115	
					13.9	TP34-062512-4.0 @ 1120	
5					78	TP34-062512-6.0 @ 1125	
		8-16' bgs: Well-graded SAND with silt and gravel (50% sand, 40% gravel, 10% silt), fine to coarse sand, fine to coarse gravel, black, moist to wet, odor, sheen, no anthropogenic debris.	SW-SM		933	TP34-062512-8.0 @ 1130	
10					1163	TP34-062512-10.0 @ 1135	
					1034	TP34-062512-12.0 @ 1140	
					771	TP34-062512-14.0 @ 1145	X
15					791	TP34-062512-16.0 @ 1150	

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Log of Test Pit: TP-35

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 283-006

Logged By: Jon Peterson

Date/Time Started: 06/25/12 0830
Date/Time Completed: 06/25/12 0940
Equipment: Backhoe
Excavation Company: Clear Creek
Excavation Foreman: Matt Clayton
Excavating Method: Backhoe

Sampler Type: Backhoe bucket
Depth of Water (ft bgs): 7.5
Total Excavation Depth (ft bgs): 7.5

Depth (feet bgs)	Sample Interval	Lithologic Description	USCS	USGS Graphic	PID (ppmv)	Sample ID	Sample Analyzed
0		0-5' bgs: Well-graded SAND with silt and gravel (50% sand, 40% gravel, 10% silt), fine to coarse sand, fine to coarse gravel, brown, moist, no odor, observed subrounded 12" cobbles, wood, brick, metal, plastic, asphalt, and other debris.	SW-SM				
5		5-7.5' bgs: Well-graded SAND with silt and gravel (50% sand, 40% gravel, 10% silt), fine to coarse sand, fine to coarse gravel, increasingly darker brown color with depth, moist to wet, odor, sheen, observed 2' concrete slabs, wood, brick, metal, plastic, asphalt, and other debris.	SW-SM		4.4		

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Log of Test Pit: TP36

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 283-006

Logged By: Jon Peterson

Date/Time Started: 06/25/12 0950
Date/Time Completed: 06/25/12 1030
Equipment: Backhoe
Excavation Company: Clear Creek
Excavation Foreman: Matt Clayton
Excavating Method: Backhoe

Sampler Type: Backhoe bucket
Depth of Water (ft bgs): 8
Total Excavation Depth (ft bgs): 8

Depth (feet bgs)	Sample Interval	Lithologic Description	USCS	USGS Graphic	PID (ppmv)	Sample ID	Sample Analyzed
0		0-5' bgs: Well-graded SAND with silt and gravel (70% sand, 20% gravel, 10% silt), fine to coarse sand, fine to coarse gravel, brown, moist, no odor, observed metal debris.	SW-SM				
5		5-8' bgs: Well-graded SAND with silt and gravel (70% sand, 20% gravel, 10% silt), fine to coarse sand, fine to coarse gravel, black, moist to wet, odor, sheen, observed concrete, wood, metal, and other debris.	SW-SM		134		

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Log of Test Pit: TP37

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA
Farallon PN: 283-006
Logged By: Jon Peterson

Date/Time Started: 06/25/12 1030
Date/Time Completed: 06/25/12 1100
Equipment: Backhoe
Excavation Company: Clear Creek
Excavation Foreman: Matt Clayton
Excavating Method: Backhoe

Sampler Type: Backhoe bucket
Depth of Water (ft bgs): 8
Total Excavation Depth (ft bgs): 12

Depth (feet bgs)	Sample Interval	Lithologic Description	USCS	USGS Graphic	PID (ppmv)	Sample ID	Sample Analyzed
0		0-5' bgs: Well-graded SAND with silt and gravel (50% sand, 40% gravel, 10% silt), fine to coarse sand, fine to coarse gravel, brown, moist, no odor, no sheen, observed concrete slabs and metal debris.	SW-SM		0.3		
5		5-12' bgs: Well-graded SAND with silt and gravel (50% sand, 40% gravel, 10% silt) , fine to coarse sand, fine to coarse gravel, black, moist, odor, sheen, observed concrete, wood, metal, and other debris.	SW-SM		242		
10					556	TP37-062512-11.7 @ 1100	

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Log of Test Pit: TP38

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA
Farallon PN: 283-006
Logged By: Jon Peterson

Date/Time Started: 06/26/12 0930
Date/Time Completed: 06/26/12 1050
Equipment: Backhoe
Excavation Company: Clear Creek
Excavation Foreman: Matt Clayton
Excavating Method: Backhoe

Sampler Type: Backhoe bucket
Depth of Water (ft bgs): 14
Total Excavation Depth (ft bgs): 16

Depth (feet bgs)	Sample Interval	Lithologic Description	USCS	USGS Graphic	PID (ppmv)	Sample ID	Sample Analyzed
0		0-3.5' bgs: Broken concrete with some poorly-graded sand, fine to medium sand, tan, dry, no odor.	SW		0.0	TP38-062612-2.0 @ 0940	
		3.5-12' bgs: Silty SAND (80% sand, 20% silt), fine to medium sand, black, moist, no odor, light sheen, wood, observed plastic and metal debris.	SM		0.0	TP38-062612-4.0 @ 0945	X
5					0.0	TP38-062612-6.0 @ 0950	
					0.0	TP38-062612-8.0 @ 0955	
10					57	TP38-062612-10.0 @ 1000	X
		12-13' bgs: Poorly graded SAND (100% sand), fine to medium sand, gray, moist, no odor.	SW		2.0	TP38-062612-12.0 @ 1005	X
		13-16' bgs: Poorly graded SAND with gravel (55% sand, 45% gravel), coarse sand, coarse gravel, gray, moist to wet, no odor, no sheen, no anthropogenic debris below 12' bgs.	SP		0.0	TP38-062612-14.0 @ 1010	
15					0.0	TP38-062612-16.0 @ 1015	X

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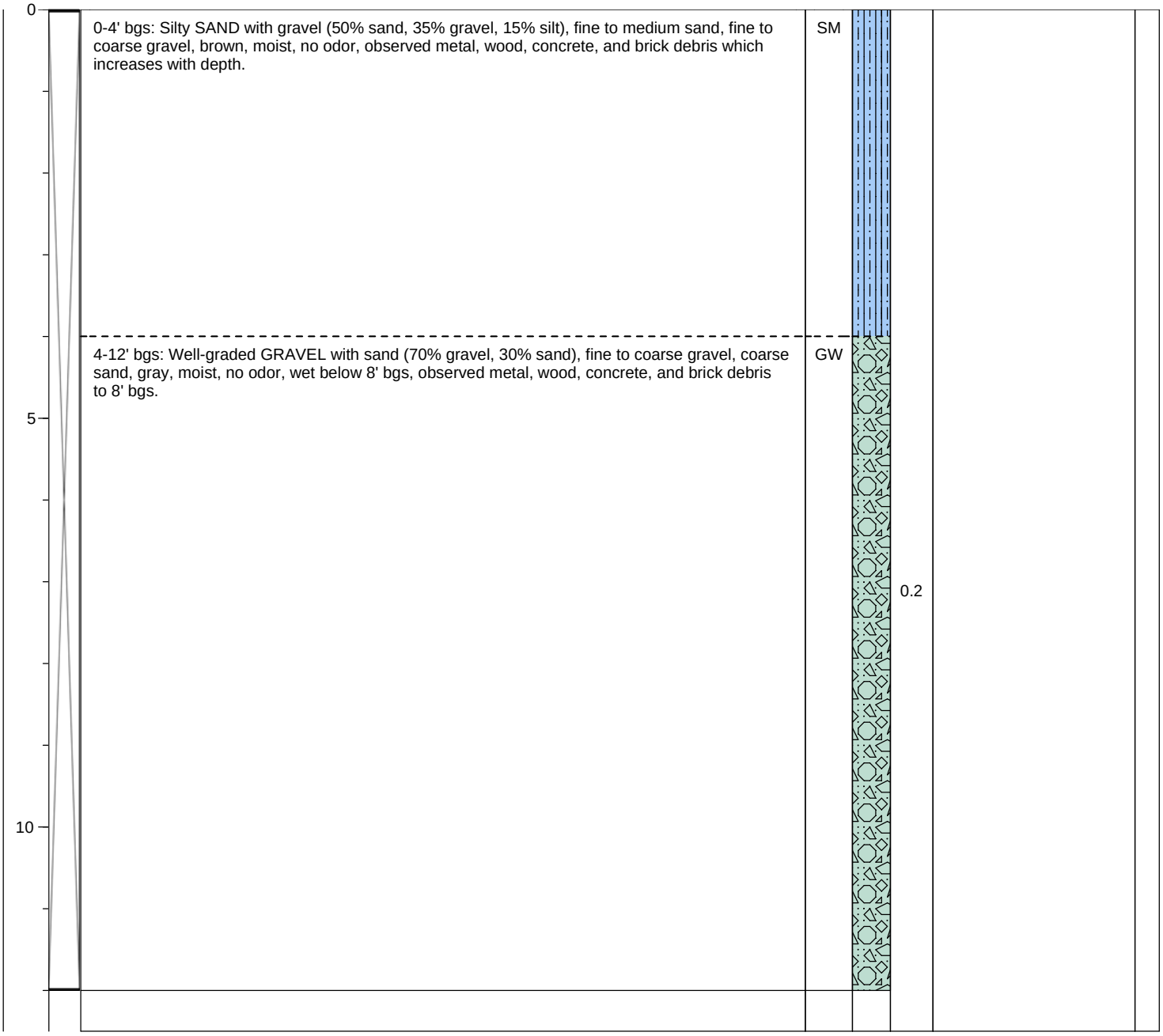
Log of Test Pit: TP39

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA
Farallon PN: 283-006
Logged By: Jon Peterson

Date/Time Started: 06/26/12 1055
Date/Time Completed: 06/26/12 1130
Equipment: Backhoe
Excavation Company: Clear Creek
Excavation Foreman: Matt Clayton
Excavating Method: Backhoe

Sampler Type: Backhoe bucket
Depth of Water (ft bgs): 8
Total Excavation Depth (ft bgs): 12

Depth (feet bgs)	Sample Interval	Lithologic Description	USCS	USGS Graphic	PID (ppmv)	Sample ID	Sample Analyzed
0		0-4' bgs: Silty SAND with gravel (50% sand, 35% gravel, 15% silt), fine to medium sand, fine to coarse gravel, brown, moist, no odor, observed metal, wood, concrete, and brick debris which increases with depth.	SM				
5		4-12' bgs: Well-graded GRAVEL with sand (70% gravel, 30% sand), fine to coarse gravel, coarse sand, gray, moist, no odor, wet below 8' bgs, observed metal, wood, concrete, and brick debris to 8' bgs.	GW		0.2		
10							



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Log of Test Pit: TP40

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA

Farallon PN: 283-006

Logged By: Jon Peterson

Date/Time Started: 06/26/12 1130
Date/Time Completed: 06/26/12 1155
Equipment: Backhoe
Excavation Company: Clear Creek
Excavation Foreman: Matt Clayton
Excavating Method: Backhoe

Sampler Type: Backhoe bucket
Depth of Water (ft bgs): 8
Total Excavation Depth (ft bgs): 13

Depth (feet bgs)	Sample Interval	Lithologic Description	USCS	USGS Graphic	PID (ppmv)	Sample ID	Sample Analyzed
0		0-3.5 bgs: Silty SAND with gravel (50% sand, 30% gravel, 20% silt), fine to medium sand, fine to coarse gravel, brown, dry, no odor, observed bricks, concrete, and metal debris.	SM				
		3.5-13' bgs: Silty sand with gravel (50% sand, 35% gravel, 15% silt), fine to medium sand, fine to coarse gravel, brown, moist, odor, sheen, black below 5' bgs, wet below 8', black liquid surface of water, silt decreases with depth, no anthropogenic debris observed below 8' bgs.	SM		308		
5							
10							

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Log of Test Pit: TP41

Client: BNSF
Project: John Michael Lease Site
Location: Cashmere, WA
Farallon PN: 283-006
Logged By: Jon Peterson

Date/Time Started: 06/26/12 1155
Date/Time Completed: 06/26/12 1250
Equipment: Backhoe
Excavation Company: Clear Creek
Excavation Foreman: Matt Clayton
Excavating Method: Backhoe

Sampler Type: Backhoe bucket
Depth of Water (ft bgs): 8
Total Excavation Depth (ft bgs): 12

Depth (feet bgs)	Sample Interval	Lithologic Description	USCS	USGS Graphic	PID (ppmv)	Sample ID	Sample Analyzed
0		0-7' bgs: Well-graded SAND with silt and gravel (50% sand, 40% gravel, 10% silt), fine to medium sand, fine to coarse gravel, brown, moist, no odor, concrete debris decreasing with depth past 5' bgs.	SW				
5		7-12' bgs: Well-graded SAND with silt and gravel (50% sand, 20% gravel, 10% silt), fine to medium sand, fine to coarse gravel, black, moist, odor, sheen, no anthropogenic debris, wet below 8'.	SW				
10					913	TP41-062612-10.0 @ 1440	

Appendix B: Terrestrial Ecological Evaluation Supporting Data

Table 749-1

Simplified Terrestrial Ecological Evaluation-Exposure Analysis Procedure

Estimate the area of contiguous (connected) undeveloped land on the site or within 500 feet of any area of the site to the nearest 1/2 acre (1/4 acre if the area is less than 0.5 acre).	
1) From the table below, find the number of points corresponding to the area and enter this number in the field to the right.	
Area (acres) / Points 0.25 or less / 4 0.5 / 5 1.0 / 6 1.5 / 7 2.0 / 8 2.5 / 9 3.0 / 10 3.5 / 11 4.0 or more / 12	8
2) Is this an industrial or commercial property? If yes, enter a score of 3. If no, enter a score of 1	3
3)[a] Enter a score in the box to the right for the habitat quality of the site, using the following rating system[b]. High=1, Intermediate=2, Low=3	3
4) Is the undeveloped land likely to attract wildlife? If yes, enter a score of 1 in the box to the right. If no, enter a score of 2.[c]	1
5) Are there any of the following soil contaminants present: Chlorinated dioxins/furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, pentachlorobenzene? If yes, enter a score of 1 in the box to the right. If no, enter a score of 4.	4
6) Add the numbers in the boxes on lines 2-5 and enter this number in the box to the right. If this number is larger than the number in the box on line 1, the simplified evaluation may be ended.	11

Notes for Table 749-1

[a] It is expected that this habitat evaluation will be undertaken by an experienced field biologist. If this is not the case, enter a conservative score of (1) for questions 3 and 4.

[b] **Habitat rating system.** Rate the quality of the habitat as high, intermediate or low based on your professional judgment as a field biologist. The following are suggested factors to consider in making this evaluation:

> **Low:** Early successional vegetative stands; vegetation predominantly noxious, nonnative, exotic plant species or weeds. Areas severely disturbed by human activity, including intensively cultivated croplands. Areas isolated from other habitat used by wildlife.

High: Area is ecologically significant for one or more of the following reasons: Late-successional native plant communities present; relatively high species diversity; used by an uncommon or rare species; priority habitat (as defined by the Washington Department of fish and Wildlife); part of a larger area of habitat where size or fragmentation may be important for the retention of some species.

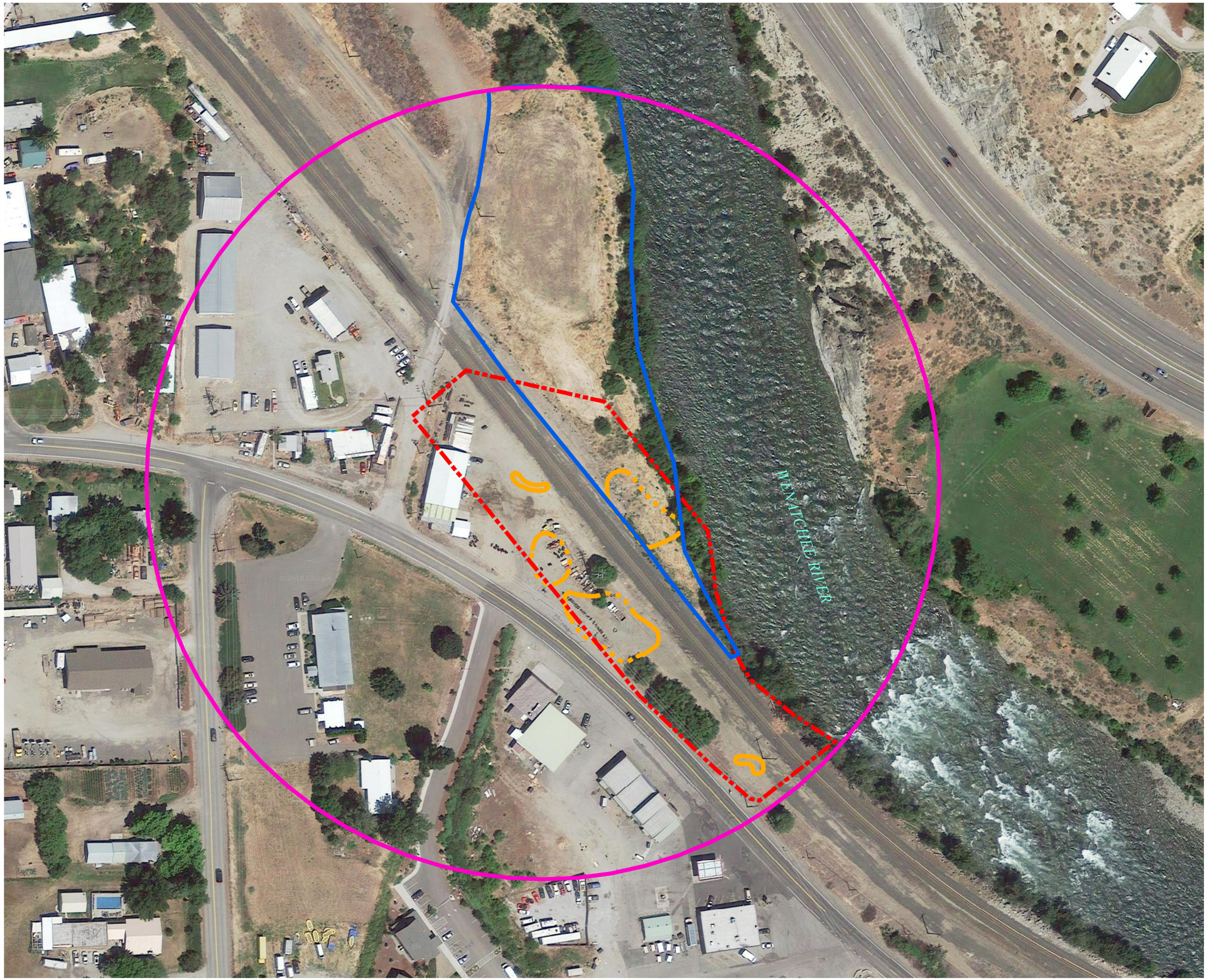
Intermediate: Area does not rate as either high or low.

[c] Indicate "yes" if the area attracts wildlife or is likely to do so. Examples: Birds frequently visit the area to feed; evidence of high use b mammals (tracks, scat, etc.); habitat "island" in an industrial area; unusual features of an area that make it important for feeding animals; heavy use during seasonal migrations.

[Area Calculation Aid] [Aerial Photo with Area Designations] [TEE Table 749-1] [Index of Tables]

[Exclusions Main] [TEE Definitions] [Simplified or Site-Specific?] [Simplified Ecological Evaluation] [Site-Specific Ecological Evaluation] [WAC 173-340-7493]

[TEE Home]



LEGEND

- Approximate Site Boundary
- 500 foot boundary for Simplified Terrestrial Ecological Evalution
- Contiguous Undeveloped Land on the site or Within 500 feet of any area of the site
- Approximate Area of Constituents of Concern Exceeding the MTCA Method A Cleanup Levels

SOURCE:
Aerial base map provided by Google Earth Professional, dated 7/1/2017.

N

0 120 240 Feet

1 " = 120 '
1:1,440

PROJECT:
JOHN MICHAEL LEASE SITE
ADJACENT TO 5640 SUNSET HIGHWAY
CASHMERE, WASHINGTON

TITLE:
SIMPLIFIED TERRESTRIAL ECOLOGICAL EVALUATION AREAS

DRAWN BY:	R. COLLINS	PROJ. NO.:	361614.0000.0000
CHECKED BY:	M. PIOVESAN		
APPROVED BY:	E. STATA		**FIGURE 1**
DATE:	MARCH 2020		

TRC
19874 141st Place N.E.
Woodinville, WA 98072
Phone: 425.489.1938
www.trccompanies.com

FILE NO.: 361614_Ecological.mxd

Plot Date: 3/20/2020, 14:44:37 PM by RCOLLINS -- LAYOUT: ANSI B (11"x17")
Path: S:\1-PROJECTS\BNSF\361614 JML\Supplemental RI rpt 2019\361614_Ecological.mxd
Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet (Foot US)
Map Rotation: 0

TRC - GIS