Tena Seeds, PE
Senior Engineer, Uplands Unit
Northwest Region Toxics Cleanup Program
Washington State Department of Ecology
PO Box 330316
Shoreline, WA 98133-9716

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Phone: 206 325 5254
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Date: May 23, 2025
Subject: BNSF Property Boring Logs
Agreed Order No. DE 18042
Facility Site Identification No. 75486194
Cleanup Site Identification No. 14604
Time Oil Bulk Terminal – BNSF Property
Seattle, WA

Dear Ms. Seeds,

On behalf of BNSF Railway Company (BNSF), Arcadis U.S., Inc. (Arcadis) is providing the boring logs for soil borings and monitoring well installation completed at the Time Oil BNSF Property in Seattle, Washington as part of the Remedial Investigation in accordance with the Ecology approved Remedial Investigation Work Plan (RIWP, Arcadis 2023).

Following soft dig clearance, the borings were advanced using sonic drilling technology to the depths noted in the boring logs (Attachment 1). Continuous soil cores were retrieved, screened, sampled and logged during drilling as described in accordance with the RIWP. Following completion, the entire borehole was converted to a permanent monitoring well.

Monitoring wells were constructed of 2-inch-diameter Schedule 40 polyvinyl chloride (PVC) pipe with 15 foot screens of 0.010-inch slotted PVC screen, in accordance with the Arcadis TGI – Monitoring Well Installation. Wells were installed to a depth of 37 to 39 feet bgs (Shallow WBZ); however, the screen interval and total well depth were determined in the field based on the depth to the water table and soil lithology (Attachment 1).

The enclosed boring logs for SB-BN-12 and SB-BN-13 (Attachment 1) were reviewed by the field geologist and the licensed geologist.

Please contact me or Kyle Haslam with any questions or comments regarding these boring logs.

Ms. Tena Seeds
Washington State Department of Ecology
May 23, 2025

Sincerely,
Arcadis U.S., Inc.

Jacqueline Sherburne
WA LG # 24009449

Email: jacqueline.sherburne@arcadis.com
Direct Line: 503-850-9812

CC. Scott MacDonald, BNSF
Shane DeGross, BNSF
Kyle Haslam, Arcadis
Emily Zikmund, Arcadis

References:

Arcadis 2023. Remedial Investigation Work Plan, Time Oil Bulk Terminal – BNSF Property, Seattle, WA. Prepared for BNSF Railway Company. June 26.

Attachments: Attachment 1 – Boring Logs for the following:

- SB-BN-12/MW-BN-06
- SB-BN-13/MW-BN-07

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Soil Boring and Well Construction Log

Boring/Well No.: SB-BN-12/MW-BN-06

Sheet: 1 of 2

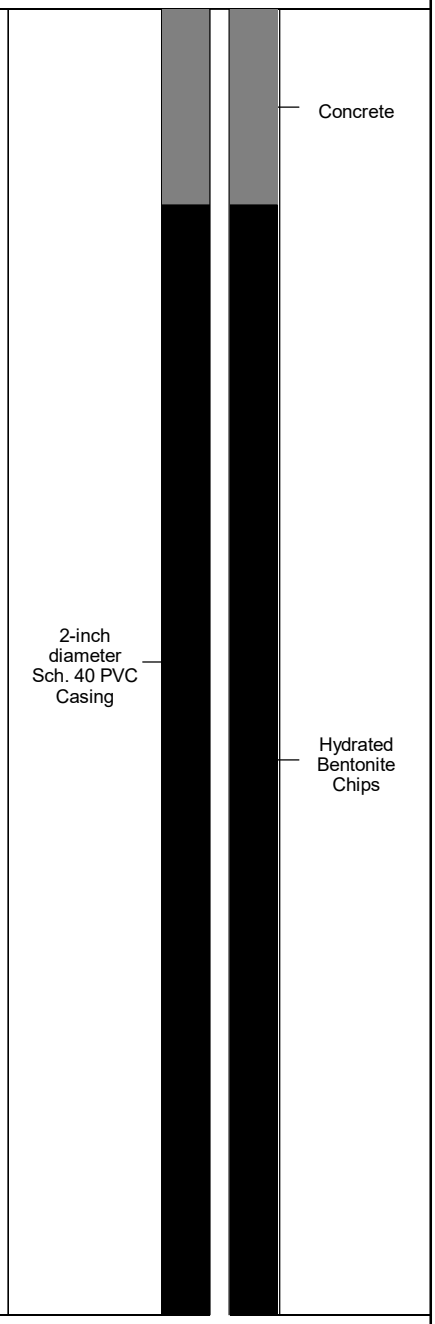
Client Name: BNSF Railway Company
Project Number: 30195976
Project Name: BNSF Time Oil RI

Date Started: 02-25-2025
Date Completed: 02-25-2025
Total Depth: 40.0 ft bgs

Logger: Kyle Johnson
Field Personnel: Matt Annis, Emily Zikmund
Reviewer: Jacqueline Sherburne, LG

Depth (feet)	Sample ID	Rec. (%)	PID (ppm)	Blow Counts	USCS Graphic	Description
1					SW	(0-1.5 ft) SAND fine to coarse grained sand, subround; some gravel, medium to very large pebbles, subround; little silt; poorly sorted, moist to wet, 10YR 5/6 - yellowish brown.
2				Air Knife	SW	(1.5-4.5 ft) Gravelly SAND, fine to coarse; some gravel, granules to small cobbles, subangular to subround; little granules, subangular to subround; little small cobbles, subround; little silt; poorly sorted, moist to wet, 10YR 5/2 - grayish brown.
3						
4						
5					ML	(4.5-5 ft) Clayey SILT, medium plasticity, slow dilatancy; some clay; little very fine sand; moist to wet, soft, 10YR 5/4 - yellowish brown.
6					SM	(5-7.5 ft) SAND and SILT, very fine to fine, no plasticity; poorly sorted, moist, medium dense, 10Y 4/1 - dark greenish gray; no odor.
7						
8					ML	(7.5-9.5 ft) SILT, low plasticity, no dilatancy; little clay; little very fine sand; moist, very stiff, 10BG 4/1 - dark greenish gray.
9						
10					SM	(9.5-11 ft) Silty SAND, very fine to fine; some silt; poorly sorted, dry to moist, very loose, 10BG 5/1 - greenish gray.
11					ML	(11-13.5 ft) SILT, no plasticity, no dilatancy; little very fine sand; little clay; dry, medium stiff, 10BG 4/1 - dark greenish gray, little 10GY 7/1 - light greenish gray.
12						
13						
14					SW	(13.5-14 ft) SAND, fine to medium; little silt; poorly sorted, moist, 10GY 4/1 - dark greenish gray.
15					CL-ML	(14-16 ft) SILT and CLAY, low to medium plasticity, no dilatancy; dry to moist, medium stiff, 10BG 4/1 - dark greenish gray.
16						
17					ML	(16-17.8 ft) SILT, low plasticity, no dilatancy; little very fine sand; little clay; dry to moist, medium stiff, 10BG 4/1 - dark greenish gray.
18					SP	(17.8-20 ft) SAND, fine to medium; well sorted, moist, 10G 4/1 - dark greenish gray.
19						
20						

Construction Details



Drilling Co.: Cascade
Driller: Joe Staloch
Driller Assistant: Tariq Barakut, Alex Esquivel
Drilling Method: Roto-Sonic
Drill Rig: Roto-Sonic
Remarks: LS 250 Rotosonic

Sampling Method: Sonic
Sampling Length: Continuous
▼ First Encountered Water (ft bgs): 31 ft bgs
▽ Static Water Level (ft btoc): NA
Top of Casing Elev: NA
Surface Elev: NA
North Coor: NA
East Coor: NA

Notes: Abbreviations: bgs = below ground surface, btoc = beneath top of casing, ft = feet, NA = not applicable, USCS Unified Soil Classification System, PVC = Polyvinyl Chloride. Northing and Easting coordinates are reported in the NAD 83 (2011) system, and the elevation is reported in the NAVD 88 system. Soil percentages are field estimates (%gravel,%sand,%silt,%clay).

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Soil Boring and Well Construction Log

Boring/Well No.: SB-BN-12/MW-BN-06

Sheet: 2 of 2

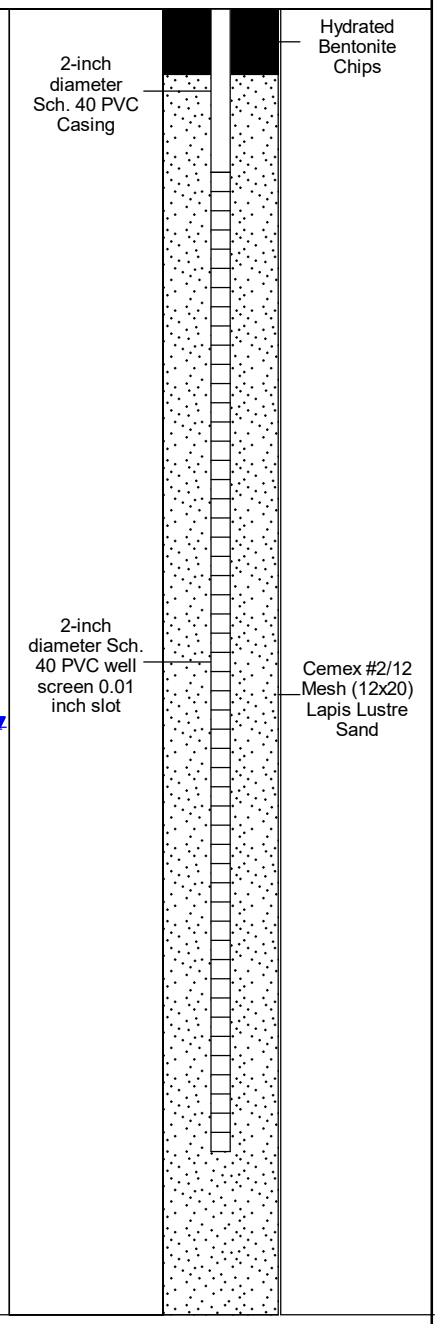
Client Name: BNSF Railway Company
Project Number: 30195976
Project Name: BNSF Time Oil RI

Date Started: 02-25-2025
Date Completed: 02-25-2025
Total Depth: 40.0 ft bgs

Logger: Kyle Johnson
Field Personnel: Matt Annis, Emily Zikmund
Reviewer: Jacqueline Sherburne, LG

Depth (feet)	Sample ID	Rec. (%)	PID (ppm)	Blow Counts	USCS Graphic	Description
20	SB-BN-12-20(022525)		0		SM	(20-20.5 ft) SAND and SILT, very fine to fine, low plasticity, no dilatancy; trace clay; poorly sorted, moist, loose, 10BG 4/1 - dark greenish gray; no odor.
21						(20.5-22.5 ft) Not logged.
22						
23					SW	(22.5-30 ft) SAND, very fine to medium; little silt; poorly sorted, moist, loose, 10BG 4/1 - dark greenish gray; from 25.0 to 30.0 ft bgs, sand grains increase to fine to medium grained.
24						
25	SB-BN-12-25(022525)		1			
26						
27						
28						
29						
30	SB-BN-12-30(022525)		31.5			(30.0-35.0 ft) Not logged.
31						
32						
33						
34						
35	SB-BN-12-35(022525)		1		SP	(35-37.5 ft) SAND, medium to coarse; well sorted, wet, 10BG 4/1 - dark greenish gray.
36						
37						
38					CL-ML	(37.5-40 ft) SILT and CLAY, low plasticity, no dilatancy; little very fine sand; dry to moist, medium stiff, 10BG 4/1 - dark greenish gray.
39						
40	SB-BN-12-40(022525)		0.3			40 ft. bgs End of Boring
41						
42						
43						

Construction Details



Notes: Abbreviations: bgs = below ground surface, btoc = beneath top of casing, ft = feet, NA = not applicable, USCS Unified Soil Classification System, PVC = Polyvinyl Chloride. Northing and Easting coordinates are reported in the NAD 83 (2011) system, and the elevation is reported in the NAVD 88 system. Soil percentages are field estimates (%gravel,%sand,%silt,%clay).

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Soil Boring and Well Construction Log

Boring/Well No.: SB-BN-13/MW-BN-07

Sheet: 1 of 2

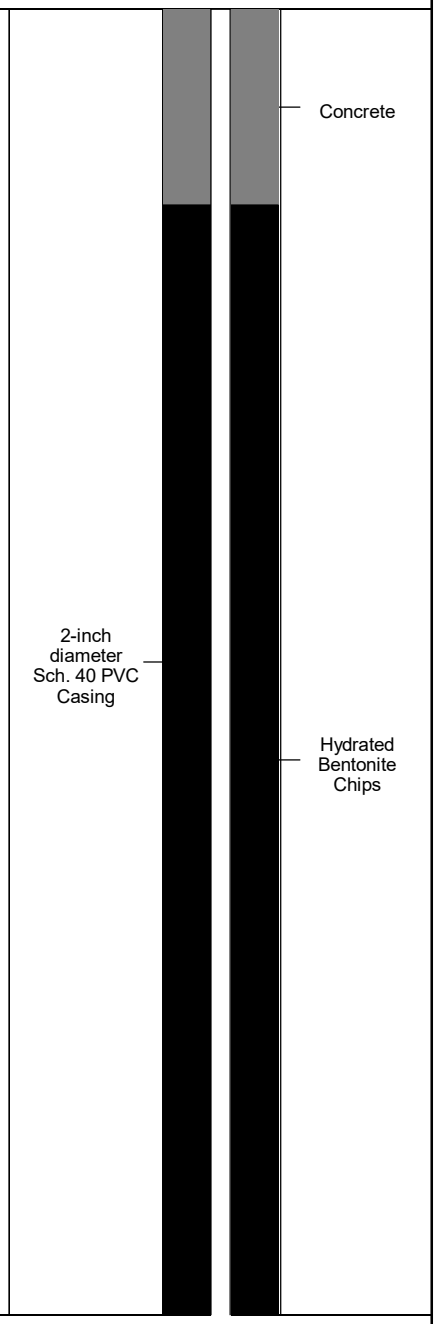
Client Name: BNSF Railway Company
Project Number: 30195976
Project Name: BNSF Time Oil RI

Date Started: 02-25-2025
Date Completed: 02-26-2025
Total Depth: 40.0 ft bgs

Logger: Kyle Johnson
Field Personnel: NA
Reviewer: Jacqueline Sherburne, LG

Depth (feet)	Sample ID	Rec. (%)	PID (ppm)	Blow Counts	USCS Graphic	Description
1				Air Knife	SW	(0-1.5 ft) Gravelly SAND, fine to coarse; some small to medium pebbles, subround; little silt; poorly sorted, wet, 10YR 5/6 - yellowish brown.
2					SW	(1.5-3 ft) Gravelly SAND, medium; some small to large pebbles, subround; little small cobbles, subround; little silt; poorly sorted, moist to wet, 10G 4/1 - dark greenish gray.
3						(3-4.5 ft) Not logged.
4						
5	SB-BN-13-5 (022525)		1		SP	(4.5-5 ft) SAND, fine to medium; well sorted, wet, 10YR 5/6 - yellowish brown.
6					SW	(5-7 ft) SAND, medium; little small pebbles, subround to round; little silt; trace granules, subangular to subround; poorly sorted, wet, 10YR 5/4 - yellowish brown, no odor.
7						
8					SW	(7-10 ft) SAND, very fine to medium; little silt; poorly sorted, wet, 10YR 5/4 - yellowish brown, no odor; at 9.5 feet bgs, color becomes gray.
9						
10	SB-BN-13-10 (022525)		20		ML	(10-14 ft) SILT, no plasticity, no dilatancy; little clay; little fine to medium sand; dry to moist, medium stiff, 10BG 4/1 - dark greenish gray, no odor; fine to medium grained sand lenses present throughout unit.
11						
12						
13						
14					SM	(14-14.5 ft) SILT and SAND, very fine, low plasticity, no dilatancy; little clay; poorly sorted, moist, soft, 10BG 4/1 - dark greenish gray, no odor.
15	SB-BN-13-15 (022525)		23		SW	(14.5-15 ft) SAND, very fine to fine; little silt; poorly sorted, moist, 10YR 5/4 - yellowish brown, no odor.
16					ML	(15-16.5 ft) SILT, no plasticity, no dilatancy; little very fine to fine sand; little clay; dry, medium stiff, 10BG 4/1 - dark greenish gray, no odor.
17					ML	(16.5-18.5 ft) Clayey SILT, low plasticity, no dilatancy; some clay; little very fine sand; dry, medium stiff, 10BG 4/1 - dark greenish gray, no odor.
18						
19					CL-ML	(18.5-21 ft) CLAY and SILT, medium plasticity, no dilatancy; little very fine sand; dry to moist, stiff, 10BG 4/1 - dark greenish gray.
20						

Construction Details



Drilling Co.: Cascade
Driller: Joe Staloch
Driller Assistant: Tariq Barakat, Alex Esquivel
Drilling Method: Roto-Sonic
Drill Rig: Roto-Sonic
Remarks: LS 250 Rotosonic

Sampling Method: Sonic
Sampling Length: Continuous
▼ First Encountered Water (ft bgs): NA
▼ Static Water Level (ft btoc): NA
Top of Casing Elev: NA
Surface Elev: NA
North Coor: NA
East Coor: NA

Notes: Abbreviations: bgs = below ground surface, btoc = beneath top of casing, ft = feet, NA = not applicable, USCS Unified Soil Classification System, PVC = Polyvinyl Chloride. Northing and Easting coordinates are reported in the NAD 83 (2011) system, and the elevation is reported in the NAVD 88 system. Soil percentages are field estimates (%gravel,%sand,%silt,%clay).

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Soil Boring and Well Construction Log

Boring/Well No.: SB-BN-13/MW-BN-07

Sheet: 2 of 2

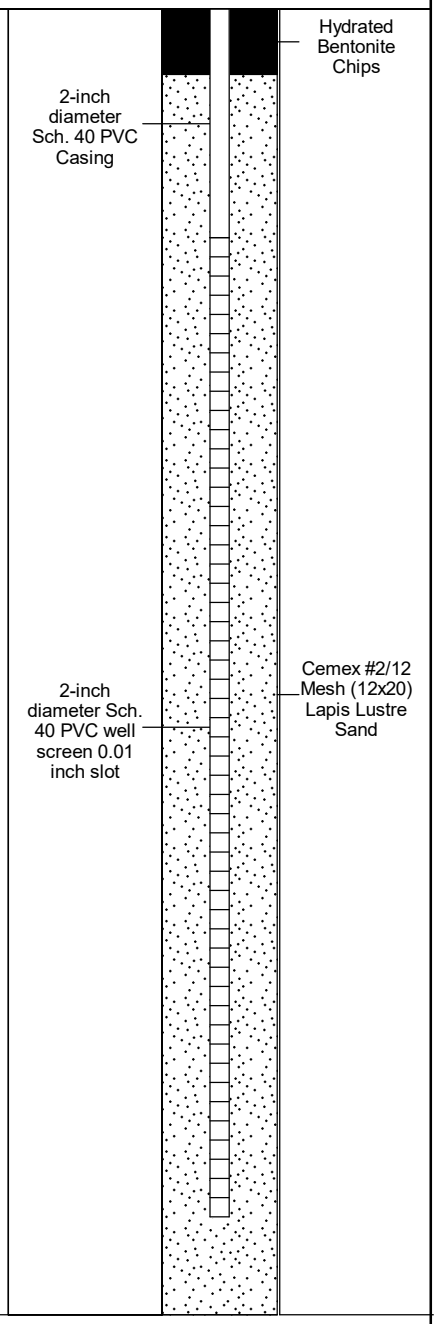
Client Name: BNSF Railway Company
Project Number: 30195976
Project Name: BNSF Time Oil RI

Date Started: 02-25-2025
Date Completed: 02-26-2025
Total Depth: 40.0 ft bgs

Logger: Kyle Johnson
Field Personnel: NA
Reviewer: Jacqueline Sherburne, LG

Depth (feet)	Sample ID	Rec. (%)	PID (ppm)	Blow Counts	USCS Graphic	Description
20	SB-BN-13-20 (022525)		0.6		CL-ML	(18.5-21 ft) CLAY and SILT, medium plasticity, no dilatancy; little very fine sand; dry to moist, stiff, 10BG 4/1 - dark greenish gray.
21					ML	(21-21.8 ft) SILT, low plasticity, slow dilatancy; little very fine to coarse sand; little clay; moist, medium stiff, 10YR 5/6 - yellowish brown, no odor.
22					SM	(21.8-23 ft) SAND and SILT, very fine to fine, no plasticity, no dilatancy; poorly sorted, wet, loose, 10YR 3/4 - dark yellowish brown.
23					SW	(23-26.5 ft) Silty SAND, fine to medium; some silt; trace clay; poorly sorted, wet, 10YR 3/4 - dark yellowish brown, no odor; at 24.0 ft bgs, silty clay lens present.
24						
25	SB-BN-13-25 (022525)		30.3			
26						
27					SW	(26.5-30 ft) Silty SAND, very fine to fine; some silt; poorly sorted, wet, 10BG 4/1 - dark greenish gray and 10YR 4/4 - dark yellowish brown.
28						
29						
30	SB-BN-13-30 (022525)		36		SW	(30-38.5 ft) SAND, very fine to fine; little silt; poorly sorted, wet, 10BG 4/1 - dark greenish gray.
31						
32						
33						
34						
35	SB-BN-13-35 (022525)		7.6			
36						
37						
38						
39					CL-ML	(38.5-40 ft) SILT and CLAY, low plasticity, no dilatancy; little very fine sand; moist, stiff, 10BG 4/1 - dark greenish gray.
40						40 ft. bgs End of Boring
41						
42						
43						

Construction Details



Notes: Abbreviations: bgs = below ground surface, btoc = beneath top of casing, ft = feet, NA = not applicable, USCS Unified Soil Classification System, PVC = Polyvinyl Chloride. Northing and Easting coordinates are reported in the NAD 83 (2011) system, and the elevation is reported in the NAVD 88 system. Soil percentages are field estimates (%gravel,%sand,%silt,%clay).