

**Memo**

To Sid Johnson
Process & Systems Manager
Koch Remediation & Environmental Services
Shane DeGross
Environmental Remediation Manager
BNSF Railway Company
Dwayne Hogg
Environmental Specialist
Husky Oil Operations Limited
Bill Fees
Site Manager
Washington State Department of Ecology
Bob Hilmes, P.W.
Project Engineer
Washington State Department of Transportation

From Todd McGovern, P.E.
Senior Project Manager
David P. Edwards, L.G.
Partner

Date 11 December 2019

Reference ERM Project No. 0518957

Subject SemMaterials L.P. Monitoring Well Decommissioning Report

ERM-West, Inc. (ERM) prepared this report to document the decommissioning of select monitoring wells on the former SemMaterials L.P. Site at 4327 North Thor Street in Spokane, Washington (the Site) (Figure 1).

PROJECT BACKGROUND AND SCOPE OF WORK

The Washington State Department of Transportation (WSDOT) notified BNSF that they would be initiating the North Spokane Corridor (NSC) construction in the vicinity of the Site on 30 September 2019, and requested that all monitoring wells in construction areas (cut areas and shoofly pathways) be decommissioned prior to their breaking ground. The WSDOT and BNSF identified monitoring wells that required decommissioning. Five monitoring wells (GMW-1 through GMW-5) were on the Site. Decommissioning of these wells was approved by Bill Fees in an email dated 22 July 2019. Figure 2 shows the locations of the monitoring wells that were decommissioned. A summary of the construction details of the Site monitoring wells is provided in Table 1.

FIELD PREPARATION AND COORDINATION

ERM updated the existing site-specific Health and Safety Plan (ERM-West, Inc. 2018. *Final Site-Specific Health and Safety Plan: Remedial Investigation/Feasibility Study, BNSF Railway Black Tank Property, Spokane, Washington*. January 2013. Updated January 2018) to include a job hazard analysis (JHA) to oversee the well decommissioning. Additionally, ERM required that Environmental West Exploration (EWE), the Washington State-licensed well drilling contractor based in Spokane, Washington, be retained to perform the decommissioning and provide their own JHA. The well decommissioning did not require utility location/protection as no new ground was to be disturbed. ERM coordinated the work schedule with BNSF, the WSDOT, EWE, and the Washington State Department of Ecology (WSDOE) to ensure the wells would be decommissioned in time for work on the NSC to begin.

FIELD ACTIVITIES

Between 23 and 24 September 2019, EWE decommissioned five monitoring wells in compliance with applicable state regulations (i.e., WAC-173-160-460) under the direction of Randall Wilder (License #2578), a Washington State-licensed operator employed by EWE. An ERM field geologist oversaw the decommissioning.

After removing tubing and pumps from the wells, EWE mixed a cement-bentonite grout from potable water, bentonite chips, and Portland cement. EWE used a grout pump and a 1" tremie pipe to place the grout mixture from the bottom of each well to ground surface, covering the well screen and filling the casing. EWE then utilized a sonic drill rig with a 33-foot mast and ½-inch non-spin domestic stainless steel wire rope affixed to a winch line to hoist the monuments and protective bollards vertically out of the ground. Each 2-inch well casing was exposed when its well monument was hoisted with the wire rope. EWE then ruptured and removed the well casings from 3 feet below ground surface.

The void spaces created by removing the bollards, casing, and monuments, were restored with concrete to pre-existing grade. EWE transported the well monuments, protective bollards, tubing, and the uppermost 3 feet of well casing from each decommissioned well to the Graham Road Landfill for disposal. ERM collected dedicated pumps from the wells and returned them to the owner.

Table 1 presents the decommissioning date for each well decommissioned, and Appendix A includes the WSDOE Resource Protection Well Report for each decommissioned well. These reports document the decommissioning of the wells listed in Table 1.

If you have any questions or comments regarding the decommissioning of these wells please contact Todd McGovern at 360-927-1285.

TABLE 1 CONSTRUCTION DETAILS OF DECOMMISSIONED MONITORING WELLS

Table 1
Construction Details of Decommissioned Monitoring Wells
SemMaterials Site
Spokane, Washington

Well Identification	WSDOE Unique Well Identification	Well Completion Date	Washington State Plane Coordinates, North Zone (NAD 83, feet)		Borehole Depth (feet bgs)	Ground Surface Elevation (NAVD 88, feet)	Top of Casing Elevation (NAVD 88, feet)	Screen Interval Depth to		Screen Length (feet)	Screen Slot Size (inches)	Filter Pack Depth to		Date Decommissioned
			Northing	Easting				Top (feet bgs)	Bottom (feet bgs)			Top (feet bgs)	Bottom (feet bgs)	
GMW-1	--	1-Feb-99	274059.60	2495610.00	197.0	2036.65	2039.39	173.0	193.0	20.0	0.020	172.0	197.0	9/24/2019
GMW-2	--	2-Feb-99	274043.40	2495535.30	191.0	2038.85	2041.33	167.0	187.0	20.0	0.020	164.5	191.0	9/23/2019
GMW-3	--	3-Feb-99	274049.20	2495439.20	190.0	2037.89	2040.18	168.0	188.0	20.0	0.020	166.0	190.0	9/23/2019
GMW-4	--	4-Feb-99	274032.90	2495303.00	193.0	2038.99	2041.45	170.0	190.0	20.0	0.020	168.0	193.0	9/23/2019
GMW-5	--	5-Feb-99	274055.90	2495137.60	193.0	2039.87	2042.47	172.0	192.0	20.0	0.020	170.0	193.0	9/23/2019

Notes:

Each well constructed of 2-inch-diameter schedule 40 polyvinyl chloride casing and screen

-- = No data available

bgs = below ground surface

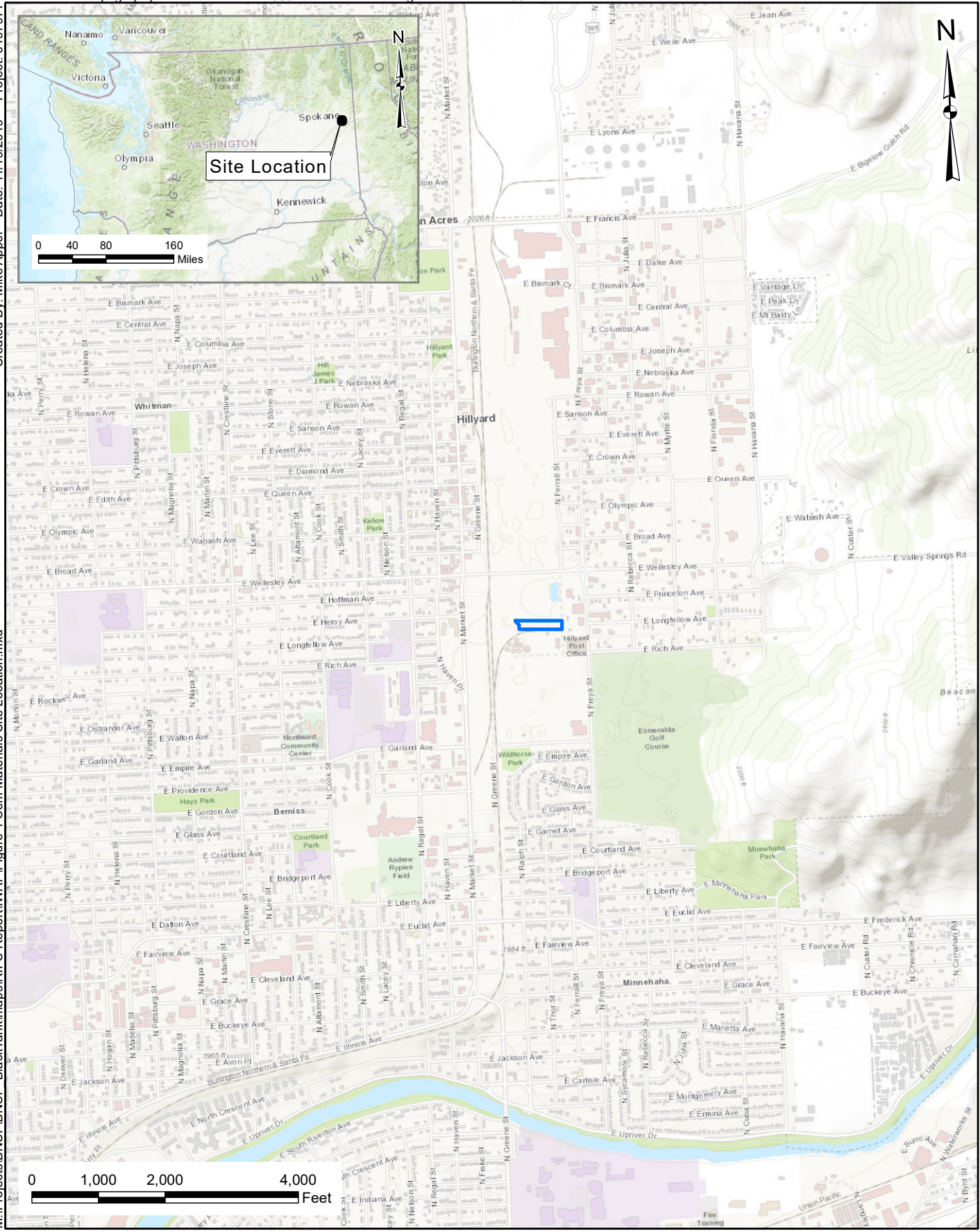
MW = Monitoring Well

NAD 83 = Coordinates in Washington State Plane, North Zone, North American Datum of 1983 (revised 1991)

NAVD 88 = North American Vertical Datum of 1988

WSDOE = Washington State Department of Ecology

FIGURES

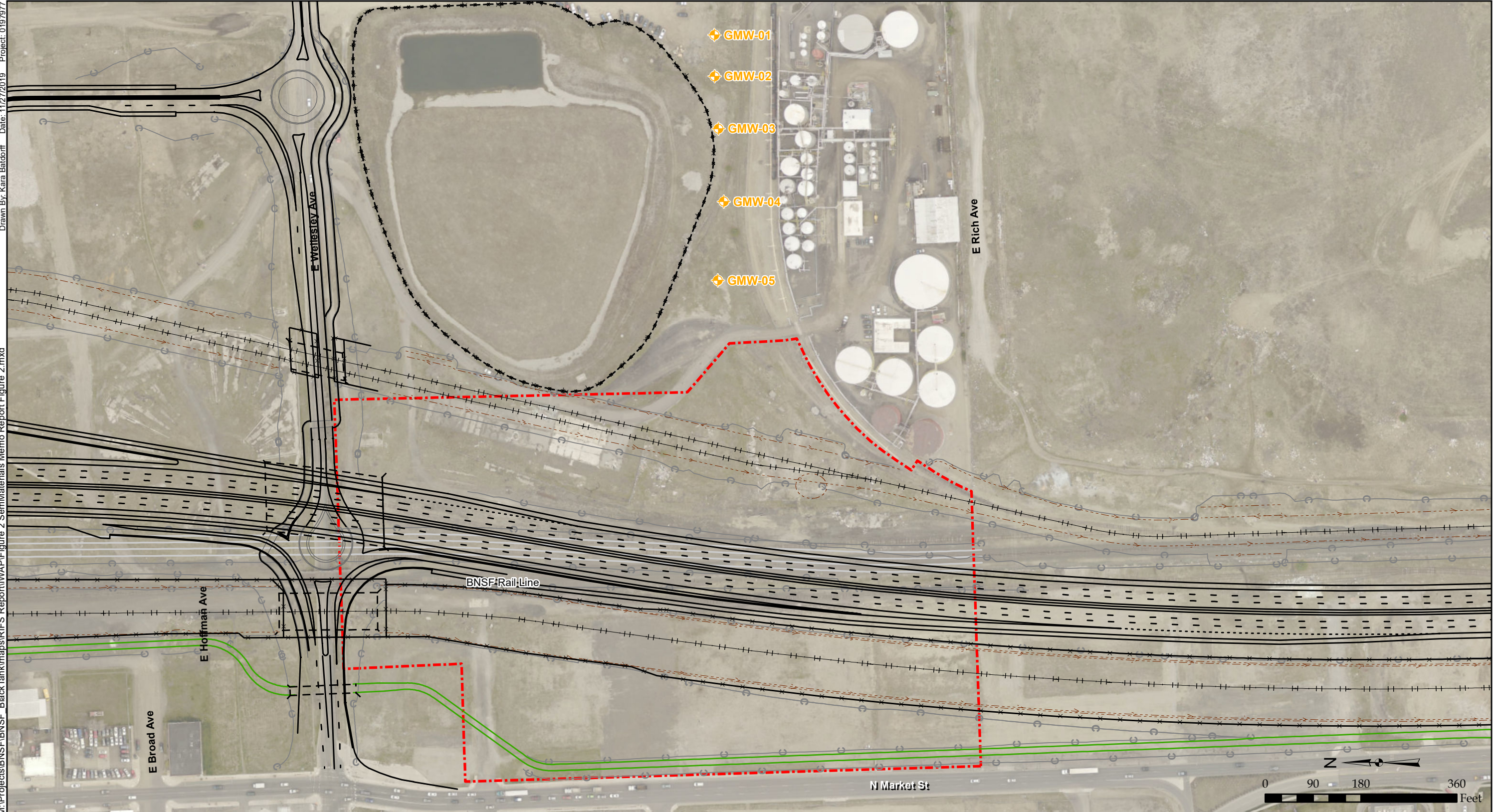


Legend

- SemMaterials MW's

Figure 1
Site Location
Spokane, Washington

M:\Projects\BNSF\BNSF Black Tank\maps\RIFS_Report\WAP\Figure 2 SemMaterials Memo Report Figure 2.mxd
 Drawn By: Kara Batdorff Date: 11/27/2019 Project: 0197977



Legend

- | | | | |
|--|---|--|--------------------|
| | Decommissioned SemMaterials Monitoring Well | | Fence |
| | BNSF Black Tank Site Boundary | | Pedestrian Pathway |
| | WSDOT Proposed Highway Alignment (2018 Version) | | Ditch |
| | Proposed Railroad Alignment | | Curb/Sidewalk |
| | Centerline | | Cut Locations |
| | Bridge | | |

Notes:
 1 Alignment subject to change
 RTF: Restoration Timeframe
 NSC = North Spokane Corridor
 WSDOT = Washington State Department of Transportation
 Aerial Photo: Spokane Image Consortium, 2018.

Figure 2
 Former Monitoring Wells
 SemMaterials
 Spokane, WA

APPENDIX A WSDOE RESOURCE PROTECTION WELL REPORTS

Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

Type of Work:

- Construction
 Decommission ⇒ Original NOI No. R 60026

Ecology Well ID Tag No. GMW-1, GMW-2, GMW-3, GMW-4

Site Well Name Black Tank

Consulting Firm Golder Associates

Was a variance approved for this well/boring? Yes No

If yes, what was the variance for? _____

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported are true to my best knowledge and belief.

- Driller Trainee Engineer

Name (Print Last, First Name) Randall Wilder

Driller/Engineer/Trainee Signature _____

License No. 2578

Company Name Environmental West Exploration Inc.

If trainee box is checked, sponsor's license number: _____

Sponsor's signature _____

Notice of Intent No. AE57664

Type of Well:

- Resource Protection Well Injection Point
 Remediation Well Grounding Well
 Geotechnical Soil Boring Ground Source Heat Pump
 Environmental Boring Other _____
 Soil- Vapor- Water-sampling

Property Owner Sem Materials

Well Street Address 4327 N Thor St

City Spokane County Spokane

Tax Parcel No. 35032.4401

Location (see instructions): WWM or EWM
NW 1/4-1/4 NW 1/4, Section 3 Town 25N Range 43E

Latitude (Example: 47.12345) _____

Longitude (Example: -120.12345) _____

(WGS 84 Coordinate System)

Borehole diameter _____ inches Casing diameter _____ inches

Static water level _____ ft below top of casing Date _____

- Above-ground completion with bollards Flush monument

Stick-up of top of well casing _____ ft above ground surface

Start Date 9/23/19 Completed Date 9/25/19

Construction Design	Well Data	Driller's Log
	<p>Trimmed Grout with Portland Bentonite Grout to surface. Pulled monument. Broke PVC off 1 foot below surface. Filled monument hole with Portland Bentonite Grout.</p>	

Resource Protection Well Report

Submit one well report per well installed. See page two for instructions.

Type of Work:

- Construction
 Decommission ⇒ Original NOI No. S 33075

Ecology Well ID Tag No. GMW-5

Site Well Name Black Tank

Consulting Firm Golder Associates

Was a variance approved for this well/boring? Yes No

If yes, what was the variance for? _____

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported are true to my best knowledge and belief.

- Driller Trainee Engineer

Name (Print Last, First Name) Randall Wilder

Driller/Engineer/Trainee Signature [Signature]

License No. 2578

Company Name Environmental West Exploration Inc.

If trainee box is checked, sponsor's license number: _____

Sponsor's signature _____

Notice of Intent No. AE57665

Type of Well:

- Resource Protection Well Injection Point
 Remediation Well Grounding Well
 Geotechnical Soil Boring Ground Source Heat Pump
 Environmental Boring Other _____

↳ Soil- Vapor- Water-sampling

Property Owner Sem Materials

Well Street Address 4327 N Thor St

City Spokane County Spokane

Tax Parcel No. 35032.4401

Location (see instructions): WWM or EWM

NE ¼-¼ NW ¼, Section 3 Town 25N Range 43E

Latitude (Example: 47.12345) _____

Longitude (Example: -120.12345) _____

(WGS 84 Coordinate System)

Borehole diameter _____ inches Casing diameter _____ inches

Static water level _____ ft below top of casing Date _____

- Above-ground completion with bollards Flush monument

↳ Stick-up of top of well casing _____ ft above ground surface

Start Date 9/23/19 Completed Date 9/25/19

Construction Design	Well Data	Driller's Log
	<p>Trimmed Grout with Portland Bentonite Grout to surface. Pulled monument. Broke PVC off 1 foot below surface. Filled monument hole with Portland Bentonite Grout.</p>	