SITE HAZARD ASSESSMENT
Worksheet 1
Summary Score Sheet

SITE INFORMATION:

Cleanup Site ID: 5112

Chevron 60090968

Facility/Site ID: 2472

2021 NW Market St

Seattle, King County, WA 98107

Section:	11	Latitude:	47.66838
Township:	25	Longitude:	-122.38376
Range:	03E	Tax/Parcel ID:	276770-3615, 276770-3515

Site scored/ranked for the Hazardous Sites List Publication: August 2018

SITE DESCRIPTION:

The Chevron 60090968 site (Site) is a former gasoline station located in Seattle, King County, Washington. The 0.28-acre property is located approximately 1,100 feet from Salmon Bay, and zoned for neighborhood commercial (NC3P-65) use.

Properties adjacent to or across roads adjacent to the Site are primarily occupied by retail stores and restaurants. Bergen Place, an art park, is located west of the Site. Canal Street Condominiums, a multi-family residential mixed-use building, is located south of the Site.

The Site is currently operated as retail space with multiple tenants by Azose Commercial Properties.

The Site is located on NW Market Street between Leary Avenue NW and Russell Avenue NW in the Ballard neighborhood of Seattle. It was occupied by a Chevron service station until decommissioning in 1989. In 1995, the property was sold to Morris Piha Management Group (now Azose Commercial Properties), which developed the property for retail use.

The Site encompasses two parcels. On the western parcel (parcel no. 276770-3615), there are two buildings with centrally located parking spaces. Sunny Teriyaki currently occupies the southern building and Pho Than Brothers, Bayside Wireless, and Thai Thani Kitchen are all tenants in the northern building. The eastern parcel on the Site (parcel no. 276770-3515) is occupied by one retail building. Current tenants are Bella Nails & Spa and Two Smiling Feet. This SHA will primarily focus on the western parcel, as this is where historical contaminant sources were located and where remediation and monitoring activities have been focused.

SITE BACKGROUND:

A summary of prior operations/tenants at the subject property is presented below.

From	To	Operator/Tenant	Activity
1934	1971	Hugh, Banks, & Jasperson	Gasoline and automotive service station
1971	1989	Chevron	Gasoline and automotive service station
1989	1995	Chevron	Vacant following gas station decommissioning
1995	2018	Morris Piha Management Group (now Azose Commercial Properties)	Restaurant and retail spaces, multiple tenants

SITE CONTAMINATION:

In 1989 the Chevron 60090968 site was reported to Washington State Department of Ecology (Ecology) and placed on the Confirmed and Suspected Contaminated Sites List (CSCSL).

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During station decommissioning in 1989, areas of petroleum contamination were noted in the area of the underground storage tanks (USTs) on the western parcel of the Site. These included three gasoline USTs and one used oil UST. Contamination has not been documented around the heating oil UST that was located on the eastern parcel. Contamination was not attributed to any specific release event. Results of site characterization activities indicate contamination with gasoline, based on detections of gasoline range petroleum hydrocarbons (TPH-G), benzene, toluene, ethylbenzene, and xylene (BTEX).

Site characterization activities in 1989-1990 included the installation of monitoring wells (MW-1 through -16). Soil was collected from well borings and analyzed for petroleum contamination. Soil contamination with TPH-G, toluene, ethylbenzene, and/or xylenes above MTCA Method A cleanup levels was observed in borings MW-6, -8, -9, -10, -11, and -14 at depths of 7.5 - 22.5 feet below ground surface (bgs). Soil was also collected and analyzed from locations of new monitoring wells and air sparge wells installed in 1991 (MW-17 through -22), 1995 (AS-1 through -3 and MW-23), and 2010 (MW-24 through -29). None of these soil samples indicated contamination with TPH-G or BTEX above Method A cleanup levels.

A total of 29 groundwater monitoring wells have been installed at the Site since 1989. Many of these wells have been decommissioned. Ten wells are currently being monitored quarterly on the Site. A summary of groundwater analyses is included in the attached table. Contamination has been observed primarily on the western parcel, with the exception of MW-12 on the eastern parcel. Separate phase hydrocarbons (AKA light non aqueous phase liquids or LNAPL) have been observed in MW-16 and -21, though LNAPL in MW-21 was an isolated occurrence connected to remedial activities and not Site contamination. Groundwater samples collected in 2017 indicate that MW-16 and MW-29 remain contaminated with TPH-G (both wells) and benzene (MW-16) above MTCA Method A cleanup levels.

REMEDIATION ACTIVITIES:

During removal of the USTs and dispenser islands, 1,200 cubic yards of contaminated soil were excavated. This soil was stockpiled on the Site, and a soil venting system was installed in the stockpile in May 1989. The system ran until July 1990, at which time samples indicated that the soil no longer contained TPH above regulatory limits. The soil was moved off Site and used as fill at another Chevron facility. To address petroleum contamination remaining outside the excavation limits, an in situ soil venting system was installed in January 1990. This system ran until September 1995. To enhance the efficacy of the system, bubblers were installed in MW-10 and MW-12 in September 1990. Air sparging wells (AS-1 through -3) were installed in 1994. Overall, the system removed approximately 2,400 pounds of petroleum from the soil.

To address contaminated groundwater, a pump and treat system was installed in May 1992. Groundwater was extracted at PW-1, treated, and discharged to the sanitary sewer system. The system ran until December 1992, when hydrocarbons and a green liquid were observed in MW-21, which had previously been uncontaminated. The proposed source of this contamination is the neighboring Wilson Ford property (now Canal Street Condominiums) due to groundwater flow changes caused by the pump and treat system. To address LNAPL that remained in MW-16, an absorbent sock was installed in December 2009.

The Site was enrolled in Ecology's Voluntary Cleanup Program from 2006-2008 (VCP ID: NW1580). The final opinion letter, issued in December 2008, indicated that Further Action was needed to address contamination remaining at the Site.

CURRENT SITE CONDITIONS:

The Site is located within the Ballard neighborhood of Seattle. It utilizes city water, sewer, and stormwater systems. There are no drinking water wells within 2 miles of the Site. There is one groundwater well located 1.5 miles southeast of the Site, used by the King County Environmental Lab as a water source for fish propagation in experimental systems. Based on the separation of this well from the Site by Salmon Bay, it is unlikely that shallow contaminated groundwater at the Site will reach the well and it was not considered in scoring. Bergen Place and Marvin's Garden, small park spaces with art and benches, are located within 300 feet of the Site to the west and southwest. The closest park with green space is Ballard Commons Park, located 675 feet northwest of the Site. The closest school is St. Alphonsus Catholic School, located 2,300 feet northeast of the Site.

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There are 27 additional Ecology cleanup sites located within one quarter mile of the Site. Six are awaiting cleanup, 11 are cleanup started, and 10 have received an NFA. The adjacent property to the south, currently the Canal Street Apartments and formerly the location of Wilson Ford, is one of these contaminated sites. The property was divided into 2 sites, and both successfully received an NFA through the Voluntary Cleanup Program. The Wilson Ford site (CSID 6683) received an NFA in 2003, and the Wilson Ford East Portion site (CSID 5483) received an NFA in 2005.

The approximate depth to groundwater is 27 - 37 feet below ground surface, with groundwater flowing to the south during 2017 sampling events; historical data indicated a radial flow outward from the UST area. Subsurface soils are silty sand with varying amounts of gravel to 15-25 feet bgs.

SPECIAL CONSIDERATIONS:

Checked boxes indicate routes applicable for Washington Ranking Method (WARM) scoring

☐ **Surface Water**

Not scored due to subsurface release.

☐ **Air**

Considered for scoring, but not scored. See reasoning below.

☑ **Groundwater**

Chemicals detected in groundwater on Site.

Inclusion of the air pathway in scoring was limited by the available data, specifically for soil. The most recent contaminated soil samples were collected 25+ years ago. Even at that point, contamination did not include benzene above the Method A cleanup level in any sample, and many of the contaminated samples were collected at depths greater than 15 feet bgs. A vertical screening distance of 15 feet is recommended for assessing petroleum vapor intrusion risk. A remaining area of soil contamination has been hypothesized to explain continuing groundwater contamination, but based on available data it is unlikely that this area would be less than 15 feet bgs.

More recent data in groundwater indicates contamination in wells 33 feet bgs, well over the 15 feet recommended vertical separation distance. Concentrations are also below vapor intrusion screening values (from Ecology's CLARC database) for chemicals for which those values have been established. This makes groundwater an unlikely source of air contamination at the Site.

ROUTE SCORES:

Surface Water/ Human Health:		Surface Water/ Environment:	
Air/ Human Health:		Air/ Environment:	
Groundwater/ Human Health:	43.9		

Overall Rank: 3

REFERENCES:

1 Conestoga-Rovers & Associates. 2009. Interim Action Leter: Installation of Absorbent Sock, Former Chevron Service Station 9-0968, 2021 NW Market Street, Seattle, Washington 98107.

2 Conestoga-Rovers & Associates. 2010. Work Plan for Subsurface Assessment, Former Chevron Service Station 9-0968, 2021 Northwest Market Street.

3 Conestoga-Rovers & Associates. 2011. Site Investigation Report, Former Chevron Service Station 9-0968, 2021 Northwest Market Street, Seattle, Washington.

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4 Converse Consultants NW. 1992. Phase II Subsurface Soil and Groundwater Investigation, Chevron Facility No. 60090968, 2021 NW Market Street, Seattle, Washington.

5 Converse Consultants NW. 1994. Soil Cleanup - Confirmational Sampling and Analysis, Decommissioned Chevron Facility #60090968, 2021 NW Market Street, Ballard District, Seattle, Washington.

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7 GHD. 2018. Fourth Quarter 2017 Groundwater Monitoring and Sampling Report, Former Chevron-Branded Service Station 90968, 2021 Northwest Market Street, Seattle, Washington.

8 King County iMap. Accessed 2018. https://gismaps.kingcounty.gov/iMap/

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11 Thorne Environmental. 1990. Subsurface Soil and Groundwater Quality Investigation, Chevron USA Inc. Service Station 0968, Seattle, Washington.

12 WA Dept. of Ecology. Accessed 2018. What's in My Neighborhood. https://fortress.wa.gov/ecy/neighborhood/

13 WA Dept. of Ecology. 2017. Implementation Memo No. 18. Petroleum Vapor Intrusion (PVI): Updated Screening Levels, Cleanup Levels, and Assessing PVI Threats to Future Buildings. https://fortress.wa.gov/ecy/publications/documents/1709043.pdf

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15 WA Dept. of Ecology. Cleanup Levels and Risk Calculation (CLARC), 2015 update edition. https://fortress.wa.gov/ecy/clarc/

16 WA Dept. of Fish & Wildlife. Accessed 2018. Priority Habitats and Species (PHS on the Web). http://apps.wdfw.wa.gov/phsontheweb/

17 WA Dept. of Health Office of Drinking Water. Accessed 2018. Find Water System. https://fortress.wa.gov/doh/eh/portal/odw/si/FindWaterSystem.aspx

SITE HAZARD ASSESSMENT
Worksheet 2
Route Documentation

Cleanup Site ID: 5112 Chevron 60090968

Facility/Site ID: 2472

1. SURFACE WATER ROUTE

List those substances to be considered for scoring:

Not scored

Explain the basis for choice of substances to be used in scoring:

List those management units to be considered for scoring:

Explain basis for choice of unit to be used in scoring:

2. AIR ROUTE

List those substances to be considered for scoring:

Not scored

Explain the basis for choice of substances to be used in scoring:

List those management units to be considered for scoring:

Explain basis for choice of unit to be used in scoring:

3. GROUNDWATER ROUTE

List those substances to be considered for scoring:

TPH-G (benzene), TPH-D (naphthalene), lead

Explain the basis for choice of substances to be used in scoring:

Substances detected in groundwater on Site in recent samples (since 2010).

List those management units to be considered for scoring:

Groundwater, soil

Explain basis for choice of unit to be used in scoring:

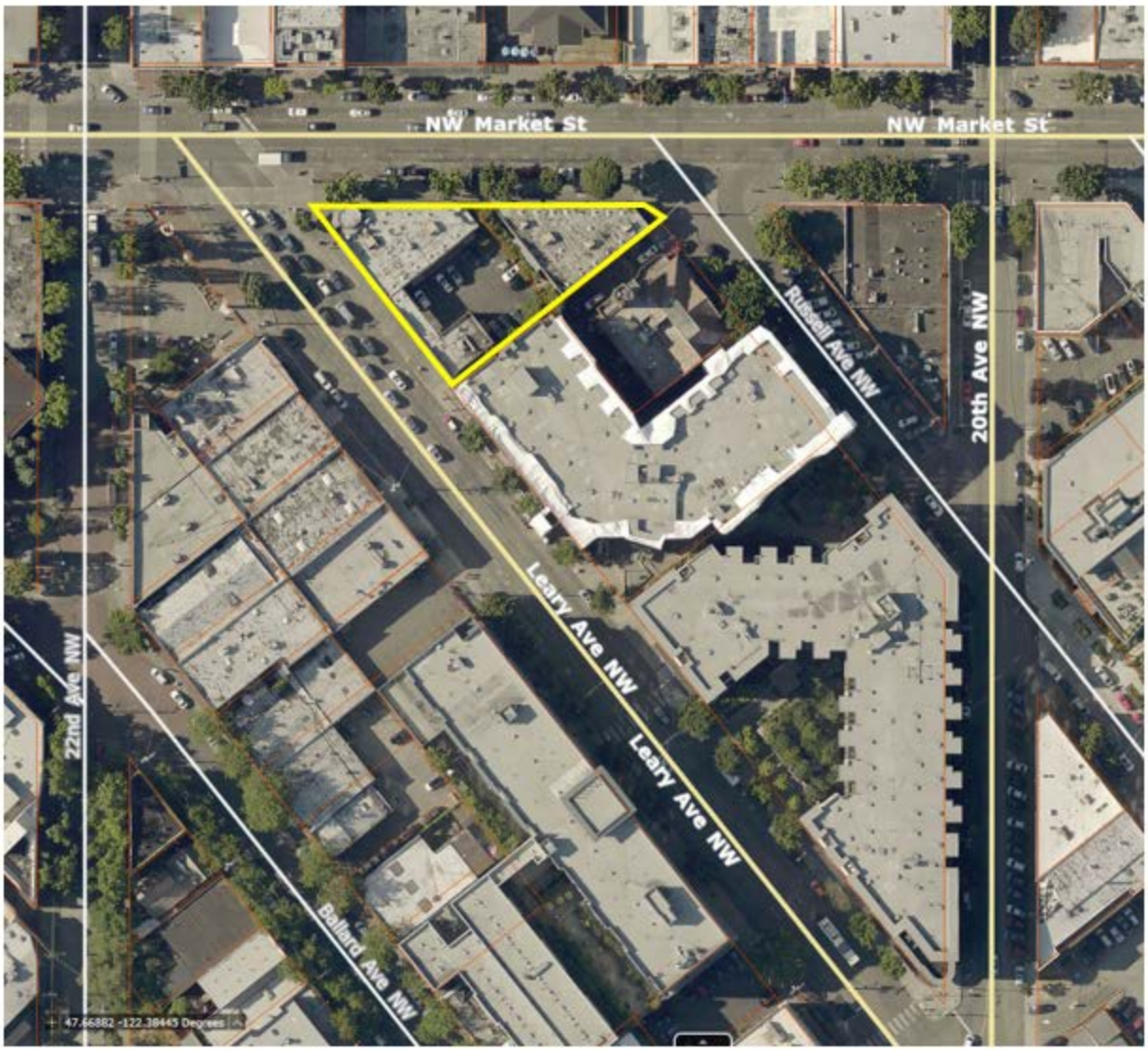
Substances detected in groundwater on Site; for scoring, remaining contamination/substance quantity was estimated as an area of soil based on groundwater exceedances of MTCA Method A in 2017 samples.

Summary of groundwater monitoring activities on Site (1991-2017).

FIRST YEAR SAMPLED	WELL ID	MAXIMUM TPH-G CONCENTRATION		OTHER CONTAMINANTS OVER METHOD A CLEANUP LEVEL	LAST YEAR SAMPLED
		µg/L	Year		
1990	MW-1	< 800[a]		none	1995
	MW-2	<800		none	1990
	MW-3	<800		B	1995
	MW-4	5,000	1994	BX	1995
	MW-5	8,200	1993	B	1995
	MW-6	36,000	1994	BX	1996
	MW-7	1,800	1993	B	1995
	MW-8	92,000	1993	B	1995
	MW-9	64,000	1991	BEX	2006
	MW-10	220,000	1991	BTEX	1995
	MW-11	18,000	1992	BEX	1995
	MW-12	81,000	1991	B	1995
	MW-13	86,000	1991	BX	1995
	MW-14	46,000	1993	BX	1995
	MW-15	3,300	1993	TPH-O, B, lead	2017
	MW-16	330,000	1993[b]	BTEX	2017
1991	MW-17	<800		none	1999
	MW-18	<800		none	2009[c]
	MW-19	<800		none	2006
	MW-20	2,300	1994	B	2002
	MW-21	15,000	2006[d]	TPH-D, EX	2017
	MW-22	<800		none	1997
1995	MW-23	3,060	2000	TPH-D, B	2006
2010	MW-24	<800		none	2017
	MW-25	<800		none	2017
	MW-26	<800		none	2017
	MW-27	<800		none	2017
	MW-28	<800		TPH-D	2017
	MW-29	1,300	2017	none	2017

Contaminant abbreviations: B – benzene; T – toluene; E – ethylbenzene; X – xylenes; TPH-G – gasoline range petroleum hydrocarbons; TPH-D – diesel range petroleum hydrocarbons; TPH-O – oil range petroleum hydrocarbons

a - 800 = MTCA Method A cleanup level for sites with benzene present
b - dissolved phase; SPH present intermittently 2006-2013
c - well is still monitored, but has been dry since 2009
d -dissolved phase; SPH present 2001



General Site location. The approximate boundary of the two parcels (more detail in the figure below) is indicated by the yellow outline.

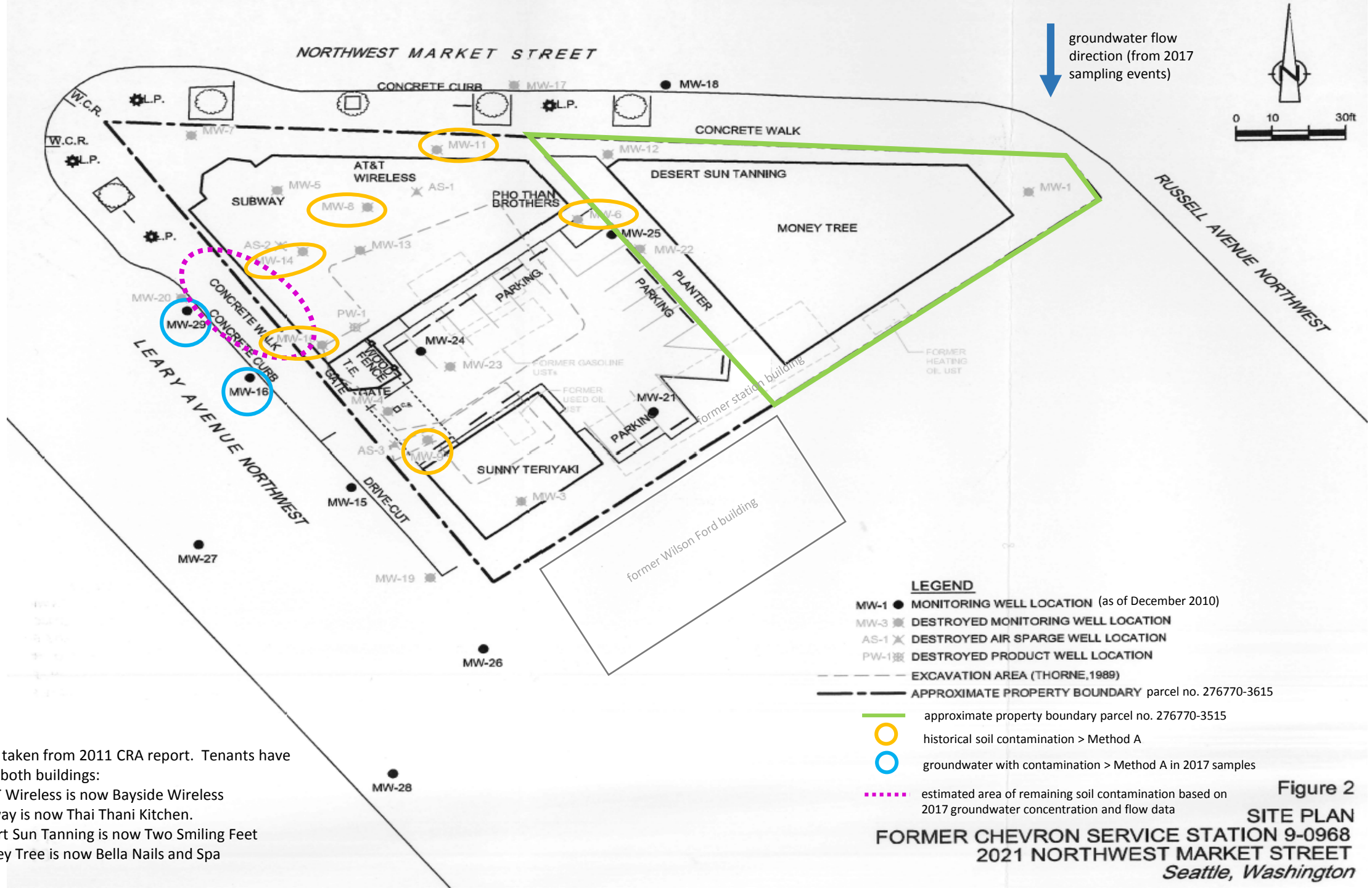


Figure 2
SITE PLAN
FORMER CHEVRON SERVICE STATION 9-0968
2021 NORTHWEST MARKET STREET
Seattle, Washington

Base figure taken from 2011 CRA report. Tenants have changed in both buildings:

- AT&T Wireless is now Bayside Wireless
- Subway is now Thai Thani Kitchen.
- Desert Sun Tanning is now Two Smiling Feet
- Money Tree is now Bella Nails and Spa

Worksheet 4
Surface Water Route

CSID: 5112

Site: Chevron 60090968

Not scored.

Worksheet 5
Air Route

CSID: 5112

Site: Chevron 60090968

Not scored.

Worksheet 6
Groundwater Route

CSID: 5112

Site: Chevron 60090968

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human toxicity

	Drink. Wat. Stnd		Acute Toxicity		Chronic Toxicity		Carcinogenicity	
Substance	Value (ug/L)	Score	Value (mg/kg)	Score	Value (mg/kg/day)	Score	Adj. CPFo (risk/mg/kg-day)	Score
benzene	5.00E+00	8	3.31E+03	3	4.00E-03	3	5.50E-02	5
naphthalene	--	X	4.90E+02	5	2.00E-02	1	--	X
lead	1.50E+01	6	<0.001	10	--	X	--	X

Maximum score: 10
Bonus points: 2
Human Toxicity Score: 12
Source: WARM Toxicity Database
Range: 1-12

1.2 Mobility

Substance	Solubility Value (mg/L)	Score
benzene	1.75E+03	3
naphthalene	3.10E+01	1
lead	0.1 < K < 1	2

Maximum value: 3
Mobility Score: 3
Source: WARM Toxicity Database
Range: 1-3

1.3 Substance quantity

Quantity: 78 cubic yards (soil)
Basis: estimated area of soil contamination (see figure) + assumed depth of 1 yard
Source: estimated from 2017 groundwater data (site reports)
Substance Quantity Score: 2
Range: 1-10

2.1 Containment

Description: chemicals detected in groundwater
Source: site reports
Containment Score: 10
Range: 0-10

SUBSTANCE PARAMETER CALCULATION

SUB = (Human Toxicity + Mobility + 3) x (Containment + 1) + Substance Quantity **200.0**

2.0 MIGRATION POTENTIAL

2.2 Net precipitation

Amount (in.):	23.3	Net Precipitation Score:	3
Source:	NOAA NCEA, ESRI	Range:	0-5

2.3 Subsurface Hydraulic Conductivity

Description:	silty sand		
Source:	site reports	Hydraulic Conductivity Score:	3
		Range:	1-4

2.4 Vertical Depth to Aquifer

Depth (ft):	0 (contaminants have reached groundwater)	Depth to Aquifer Score:	8
Source:	site reports	Range:	1-8

MIGRATION PARAMETER CALCULATION

MIG = Depth to Aquifer + Net Precipitation + Hydraulic Conductivity **14.0**

3.0 TARGETS

3.1 Aquifer Usage

Description:	groundwater not used but usable		
Source:	King County iMap, WDOH Find Water System	Aquifer Use Score:	2
		Range:	1-10

3.2 Distance to Nearest Drinking Water Well

Distance (ft):	> 2 mi	Well Distance Score:	0
Source:	King County iMap, WDOH Find Water System	Range:	0-5

3.3 Population Served by Drinking Water Wells within Two Miles — Population Served Score: 0.0

No. of people:	0	Range:	0-100
Source:	King County iMap, WDOH Find Water System		

3.4 Area Irrigated by Wells within Two Miles — Area Irrigated Score: 0.0

Area (acres):	0	Range:	0-50
Source:	WDOE WRTS, WDOE Well Log Viewer		

TARGET PARAMETER CALCULATION

2.0

TAR = Aquifer Use + Well Distance + Population Served + Area Irrigated

4.0 RELEASE

Evid. of release? confirmed detects in groundwater — Release Score (REL): 5.0

Source: site reports — Range: 0 or 5

GROUND WATER ROUTE CALCULATION

41.6

GW = (SUB x 40/208) x {(MIG x 25/17) + REL + (TAR x 30/165)} / 24

Range: 0-100

Washington Ranking Method
Route Scoring Summary and Ranking Calculation

CSID: **5112**

Site: **Chevron 60090968**

Human Health Route Scores

Pathway	Score	Quintile
Surface water	0.0	
Air	0.0	
Groundwater	41.6	4

Quintile	Value
High (H)	4
Middle (M)	
Low (L)	

Human Health Pathway Quintiles - February 2018

Quintile	Surface Water		Air		Groundwater	
1	<=	7.9	<=	8.5	<=	24.0
2	8.0	15.4	8.6	16.3	24.1	33.0
3	15.5	21.3	16.4	25.3	33.1	40.3
4	21.4	29.8	25.4	40.1	40.4	49.8
5	>=	29.9	>=	40.2	>=	49.9

$(H^2 + 2M + L) / 8$

Human Health Priority Bin Score: 2.0

Environmental Route Scores

Pathway	Score	Quintile
Surface water	0.0	
Air	0.0	

Quintile	Value
High (H)	
Low (L)	

Environmental Pathway Quintiles - February 2018

Quintile	Surface Water		Air	
1	<=	11.3	<=	1.2
2	11.4	24.1	1.3	1.5
3	24.2	32.0	1.6	14.1
4	32.1	49.6	14.2	27.7
5	>=	49.7	>=	27.8

$(H^2 + 2L) / 7$

Environmental Priority Bin Score: 0.0

FINAL MATRIX RANKING

Human Health Priority	Environmental Priority 5	4	3	2	1	n/a
5	1	1	1	1	1	1
4	1	2	2	2	3	2
3	1	2	3	4	4	3
2	2	3	4	4	5	3
1	2	3	4	5	5	5
n/a	3	4	5	5	5	NFA

n/a - not applicable

NFA - no further action

Site Rank: 3