

SITE HAZARD ASSESSMENT

SITE INFORMATION:

**7-Eleven Store 25821
1824 George Washington Way
Richland, WA 99354**

**Current Owners: Cazier Properties, LLC
Benton County Parcel ID: 102981020815007
Township/Range/Section: 10N/28E/35
Latitude: 46.30009
Longitude: -119.27409
Ecology Facility Site ID No.: 77113577
CSID No.: 6650
UST No.: 8598**

Site scored/ranked for the February 2013 update

Background

The 7-Eleven Store 25821 Site is located on the southeast corner of George Washington Way and McMurray Street in Richland, Washington. The Site is currently occupied by a Subway restaurant. The Site was previously owned by Steven Wascher and was occupied by a Mobile gas station starting in early 1960s. According to the Washington State Department of Ecology (Ecology) Underground Storage Tank (UST) Database, the owners of the Mobile gas station installed three single walled fiberglass reinforced plastic USTs in 1964. Two tanks were used for unleaded gasoline and one was used for the storage of leaded gasoline. All tanks had a 10,000 gallon capacity. The Southland Corporation leased the property in 1987 and decided to remove the tanks in 1989. They hired an environmental consulting firm, Klienfelder, to oversee the removal of these tanks.

During the removal, a gas line was broken by the contractor and approximately five gallons of gas spilled into the northwest corner of the excavation pit. The contaminated soil was removed but more contaminated soil was observed in the excavation pit distal from the initial spill. It appeared that the USTs had leaked. Ground water was also encountered at the site. Ultimately, 41 cubic yards of contaminated soil were removed from the site but contamination remained as gas and its constituents were detected via ground water monitoring wells established at the site. Ground water monitoring (GWM) was conducted on a quarterly basis to establish the attenuation of contaminants, but contaminants persisted for years. GWM switched from a quarterly basis to a semi-annual basis in 2008 and has continued to the present. Total petroleum hydrocarbons-gas (TPH-G) in ground water from MW-6 continues to remain high (**see Table 1**).

In 1990, Southland sub-leased the property to Russell Cazier who opened a Subway restaurant. In 2005 Cazier purchased the property from the Steven David Wascher Trust. Cazier is still the current property owner.

Site Sampling

Time Line of Cleanup/Sampling Activities at Site

(Information Primarily from Stantech March 2012 Cleanup Report, ref 3)

- 1989: Klienfelder performed the initial site assessment, directed the soil cleanup, and initiated groundwater monitoring from five wells (**see Figure 5**). 41 cubic yards of contaminated soil removed. One confirmatory soil sample was taken after cleanup. **The soil sample contained 12,000 mg/kg TPH-G. Groundwater also exceeded drinking water standards.**
- 1990: A sixth monitoring well (MW-6) was installed near the center of the excavation pit. Data from 1993-2011 is shown in **Table 1**. Most samples exceed cleanup levels.
- 1991: Klienfelder performed a vapor extraction test to determine feasibility of remediation. No volatile organic compounds were detected in vapors. Soil vapor extraction was deemed not feasible. Quarterly ground water monitoring (GWM) continued.
- 1996 A seventh GWM well, MW-7, installed in July slightly up gradient from the former UST complex. Klienfelder attempted to promote biological degradation by increasing O₂ levels in soil.
- 1999 Klienfelder injected nitrate to promote biodegradation. Activity was halted in 2001
- 2000 A new environmental contractor, IT Corporation, constructed eight bore holes on site to a depth of 18 feet to delineate extent of impacted soil (**see Figure 4 and 5**). Analytical data of soils collected from the bore holes are shown in **Table 2**. **Multiple bore holes contained TPH-G exceeding cleanup levels.**
- 2004 SECOR International made nine additional soil borings (**labeled “GP”, Figure 4 and 5**). These bore holes were constructed farther away from former UST complex. Soil from these bore holes were below TPH-G and BTEX MTCA Method A cleanup levels (**see Table 2**)
- 2008- SECOR became Stantec Consulting Corp and GWM shifted from quarterly monitoring to
2011 semi-annual. The last GWM report was received in May 2011. Groundwater from GWM well **MW-6 has TPH-G values (3,600 mg/kg) exceeding MTCA A Cleanup levels.**
- 2012 Stantec sent a work plan for additional site assessment on March 19, 2012. No new work has been started.

Site Hazard Assessment

Jim Coleman, Environmental Health Specialist II for the Benton-Franklin Health District (BFHD), conducted a site hazard assessment of the site on December 19, 2012. Weather was cool (~45 F) and overcast. The site is located on the corner of two main thoroughfares in Richland (population 48,000). The Subway is surrounded primarily by a residential area but there are business directly to the west (shopping mall) and north (Pizza Hut restaurant). The site is level and covered with asphalt and

cement except for some landscaping at the perimeter (see **Figures 2 and 3**). The location of the previous gas dispensers is still obvious as are most of the GWM wells (see **Figure 3C**).

The site is located approximately 2,100 feet due west of the Columbia River (see **Figure 1**). According to well drilling logs at the site, the soil consists of brown sand from approximately 3 feet to 5 feet below the ground surface (bgs). Below the brown sand down to about 21 feet bgs is primarily brown sandy gravel (1). One well bore hole also encountered some gravels mixed with cobbles (1). Ground water at the site is not very uniform but generally is found starting at 13-18 feet bgs. GWM MW-1, MW-2, and MW-5 are dry most the year.

Public drinking water is supplied to all residences in a two mile radius from the site by the City of Richland (COR). According to the Water Quality Manager at the City of Richland, the city treats surface water from the Columbia River to provide drinking water to its residents. This source provides about 70% of COR's water. The other 30% of water is supplied by ground water wells. One of these wells (Columbia) is located about 0.8 mile northeast of the site and several others are within a two mile radius (see **Figure 1**) of the site.

Richland lies within the Columbia Basin and is in the rain shadow of the Cascade Mountains. Richland receives about five to seven inches of rain annually which is scattered throughout the year with heaviest accumulations November through December. When one accounts for evaporation, there is only about a net precipitation of 1.6 inches.

Pathway Information

The **Surface Water Pathway** is not likely a significant route of potential exposure at this site, nor is the **Air Pathway**, due to the entirely subsurface nature of any possible remaining contamination.

Groundwater

SPECIAL CONSIDERATIONS (include limitations in site file data or data which cannot be accommodated in the model, but which are important in evaluating the risk associated with the site, or any other factor(s) over-riding a decision of no further action for the site): Ground water monitoring wells MW-6 and MW-7, have been analyzed for THP-G, Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) since the mid-1990's. In many instances ground water in these wells has exceeded Model Toxic Control Act (MTCA) Method A cleanup levels for ground water for these constituents. During the last sampling event, the ground water in MW-6 exceeded MTCA Method A cleanup levels (1000 ug/L) for TPH-G. However, TPH-G does not have specific human toxicity data listed in the WARM Scoring Manual (6). One constituent frequently associated with TPH-G is benzene which does have human toxicity data. Benzene was detected in MW-6 ground water at levels exceeding MTCA A cleanup levels (5 ug/uL) as recently as October 2009. Due to the fact that ground water levels can fluctuate and contaminants can migrate throughout the contamination zone (compare values TPH-G in MW-6 in 2005 compared to 2006), one must take into consideration several ground water sampling events over time. BTEX has been detected in recent events in MW-6 and benzene will be used to determine human toxicity for this site.

ROUTE SCORES:

Surface Water/Human Health: NS
Air/Human Health: NS
Groundwater/Human Health: 50.5

Surface Water/Environmental.: NS
Air/Environmental: NS

OVERALL RANK: 3

WORKSHEET 2
Route Documentation

1. **SURFACE WATER ROUTE – NOT SCORED.** No data or direct observation exists to support that contaminants were released into surface water (Columbia River ~2,100 feet to east). The site is covered primarily with asphalt.

a. List those substances to be considered for scoring:

Source:

b. Explain basis for choice of substance(s) to be used in scoring.

c. List those management units to be considered for scoring:

Source

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

2. **AIR ROUTE – NOT SCORED**

a. List those substances to be considered for scoring:

Source:

b. Explain basis for choice of substance(s) to be used in scoring:

c. List those management units to be considered for scoring:

Source:

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

3. **GROUNDWATER ROUTE**

a. List those substances to be considered for scoring:

Source: 1-3

Total Petroleum Hydrocarbons-Gas, Benzene

b. Explain basis for choice of substance(s) to be used in scoring:

These substances were detected in soil samples and ground water samples taken from the excavation pit and ground water monitoring wells.

c. List those management units to be considered for scoring:

Source: 1-3

Subsurface soil/groundwater.

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

Contaminants were detected in soil and water samples at site. Petroleum was spilled into the excavation pit and there was visible as a sheen on the surface of the water.

WORKSHEET 6
Groundwater Route

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity										
Substance	Drinking Water Standard (µg/L)	Value	Acute Toxicity (mg/ kg-bw)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value	
							WOE	PF*		
1 Benzene	5	8	3306	3	ND	ND	A	.029	5	

* Potency Factor

Source: 1-3, 5

Highest Value: 8

(Max = 10)

Plus 2 Bonus Points? 0

Final Toxicity Value: 8

(Max = 12)

1.2 Mobility (use numbers to refer to above listed substances)	
Solubility (mg/L)	
Benzene, 1800 mg/L	

Source: 5

Value: 3

(Max = 3)

1.3 Substance Quantity:	
<p>Explain basis: Region of contamination as defined by borehole sampling is approximately 42'x 30' (see Figure 5). Approximate depth of contamination is approximately 12 to 17 bgs (5 Feet). Estimated total contaminated soil is 233 cubic yards. According to Table GW-7 (6), this amount of contaminated soil would receive a value of "6".</p>	<p>Source: 1-3,6 Value: 6 (Max=10)</p>

2.0 MIGRATION POTENTIAL

		Source	Value
2.1	Containment (explain basis): Leaking UST which has been removed. Site has been capped with asphalt. Scored as a landfill with a cover but no liner or leachate collection system. Free liquids documented.	1-3,6	8 (Max = 10)
2.2	Net precipitation: 5" – 3.4" = 1.6"	1-3,6,7	1 (Max = 5)
2.3	Subsurface hydraulic conductivity: sands/gravels	1-3,6	4

			(Max = 4)
2.4	Vertical depth to groundwater: ~16 feet	1-3,6	<u>8</u> (Max = 8)

3.0 TARGETS

		Source	Value
3.1	Groundwater usage: Public supply, but alternate source available with minimum hookup requirements.	6,8	<u>4</u> (Max = 10)
3.2	Distance to nearest drinking water well: 4,200 feet	6,8	<u>2</u> (Max = 5)
3.3	Population served within 2 miles: City of Richland	6,8	<u>100</u> (Max = 100)
3.4	Area irrigated by (groundwater) wells within 2 miles: 981 acres (0.75)(31.3)=23.5	6,8	<u>24</u> (Max = 50)

4.0 RELEASE

		Source	Value
	Explain basis for scoring a release to groundwater: Confirmed release to groundwater.	1-3,6	<u>5</u> (Max = 5)

SOURCES USED IN REPORT

1. Phase II Soil and Groundwater Assessment, 7-11 Store Number 25821, 1824 George Washington Way, Richland, WA, Rory Galloway, Kleinfelder Inc., September 11, 1989.
2. Draft Feasibility Review and Draft Cleanup Action Plan, 7-11 Store No 25821, 1824 George Washington Way, Richland, WA, Rory Galloway, Kleinfelder Inc., October 24, 1991.
3. 7-Eleven, Inc. Semi-Annual Report, Deitrie Hanson, Stantec Consulting Corp., May 9, 2011.
4. Model Toxic Control Act Statute and Regulation, Washington State Department of Ecology, Publication No. 94-06, Revised November 2007.
5. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992.
6. Washington State Department of Ecology, WARM Scoring Manual, April 1992.
7. Washington Climate – Net Rainfall Table

8. Washington State Department of Ecology, Water Rights Application System (WRATS) printout for two-mile radius of site. Phone interview with Brent Andrews, Water Quality Coordinator, City of Richland, December 12, 2012.
9. Washington Department of Health, Sentry Internet Database printout for public water supplies.

Appendix I: Figures and Tables

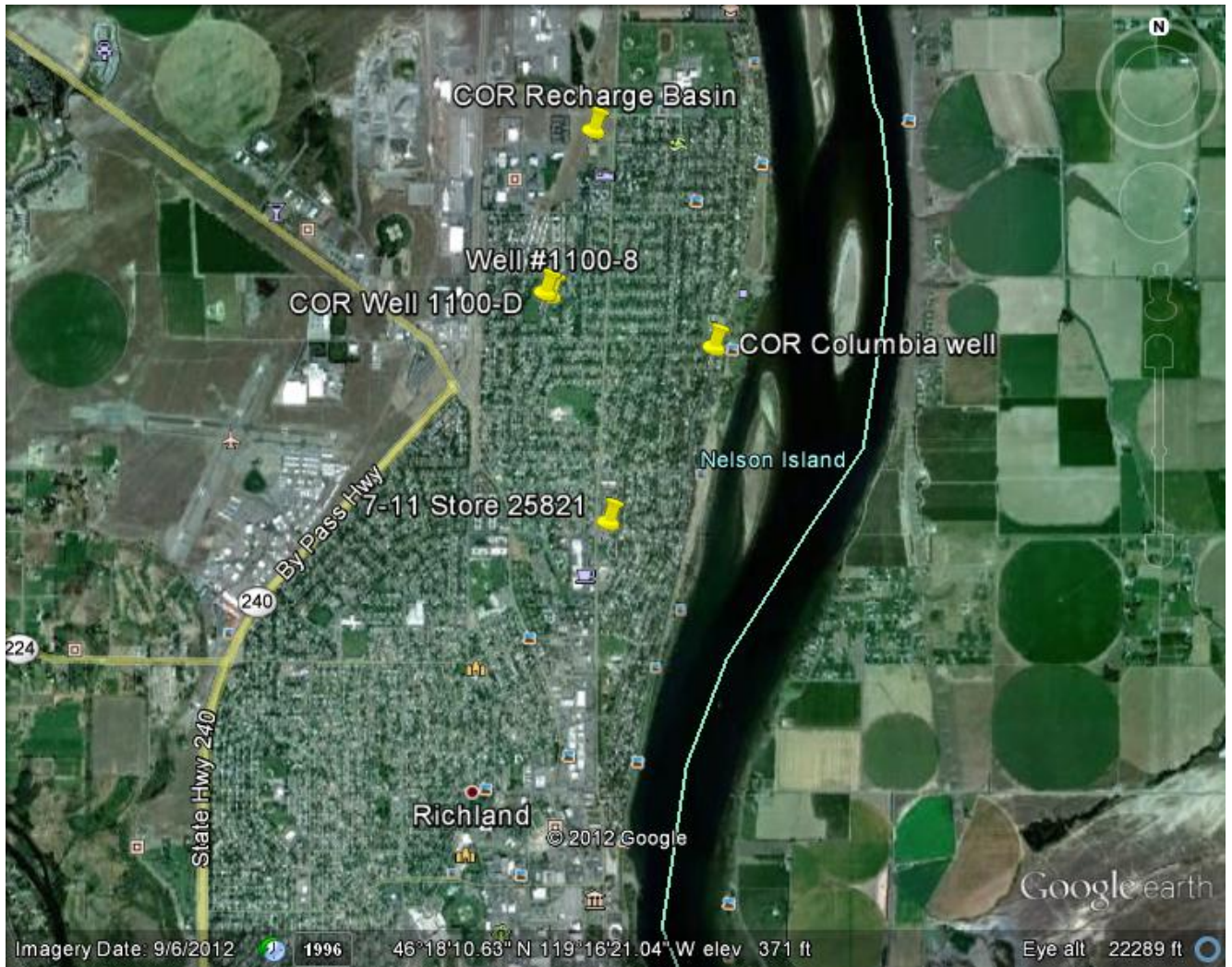


Figure 1. Aerial Photo of Richland, WA Showing Location of 7-11 Store #25821 and Surrounding Area. COR=City of Richland, Municipal Drinking Well

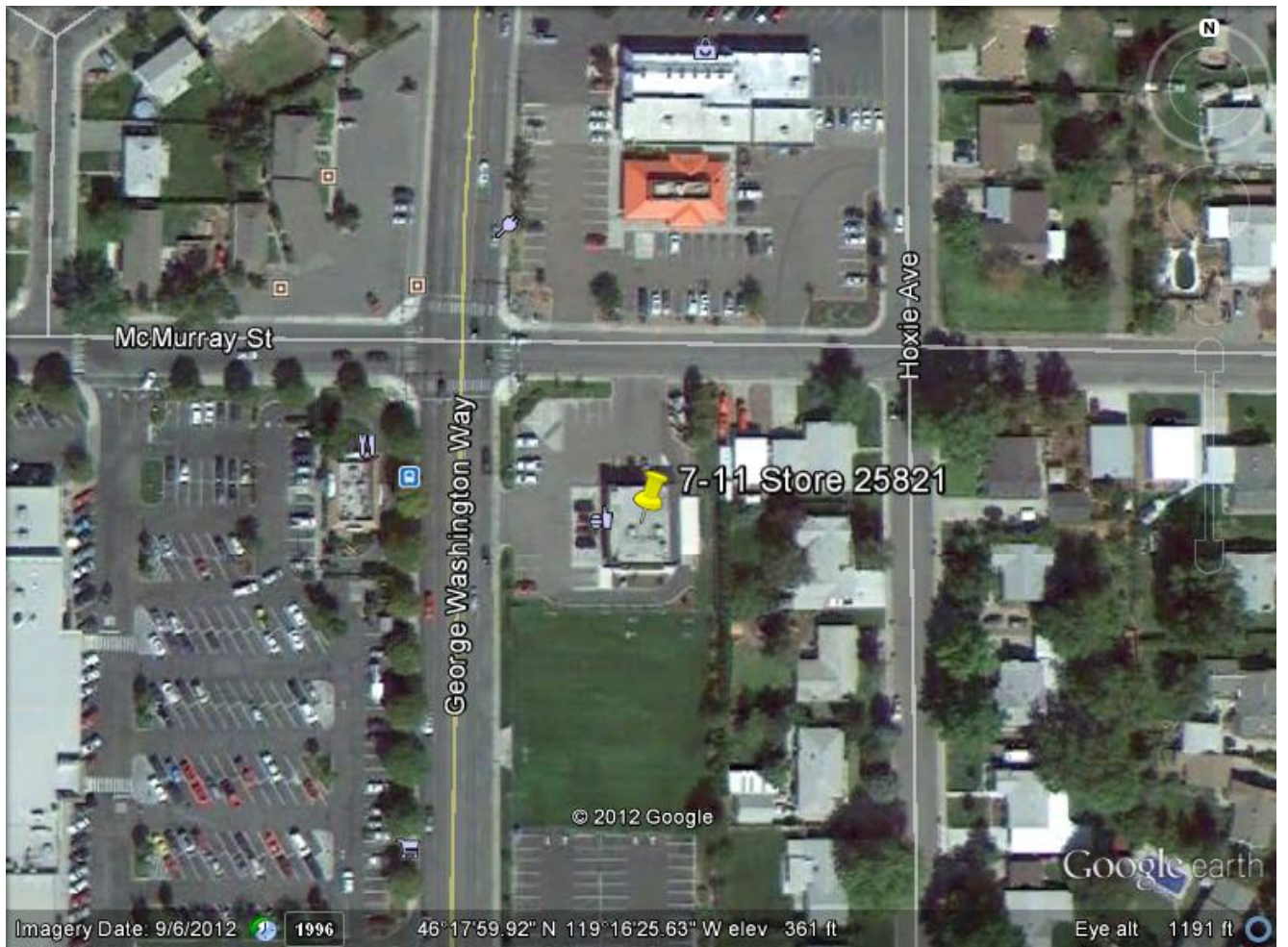


Figure 2. Close-up Aerial Photo of Richland, WA Showing 7-11 Store #25821



Figure 3. Site Photos (A) looking to SE, (B) looking to NE, (C) previous location of gas dispensers (see arrow)

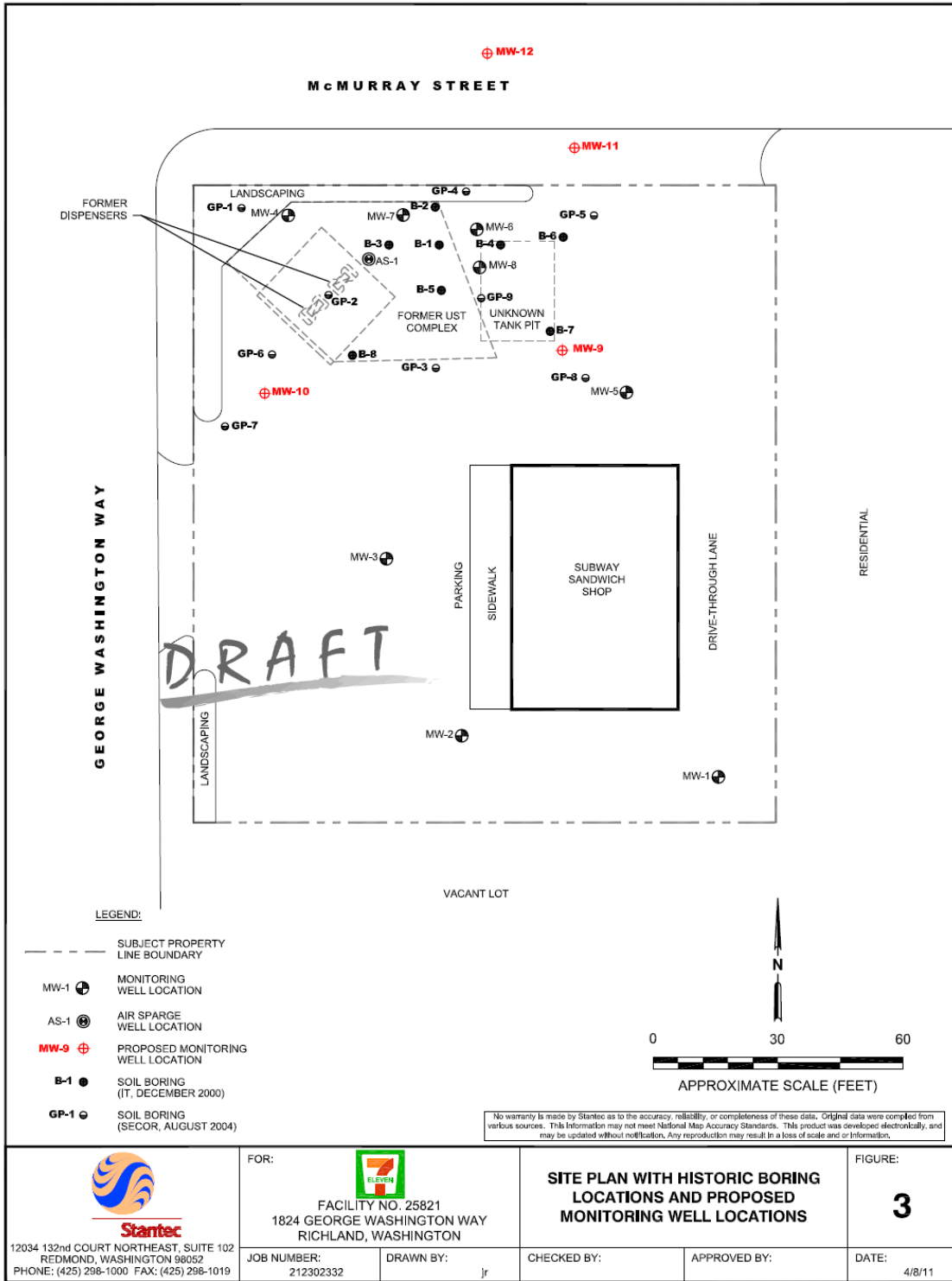


Figure 4. Site map showing ground water monitoring wells (MW-#) and soil boring holes (B-#, GP-#).

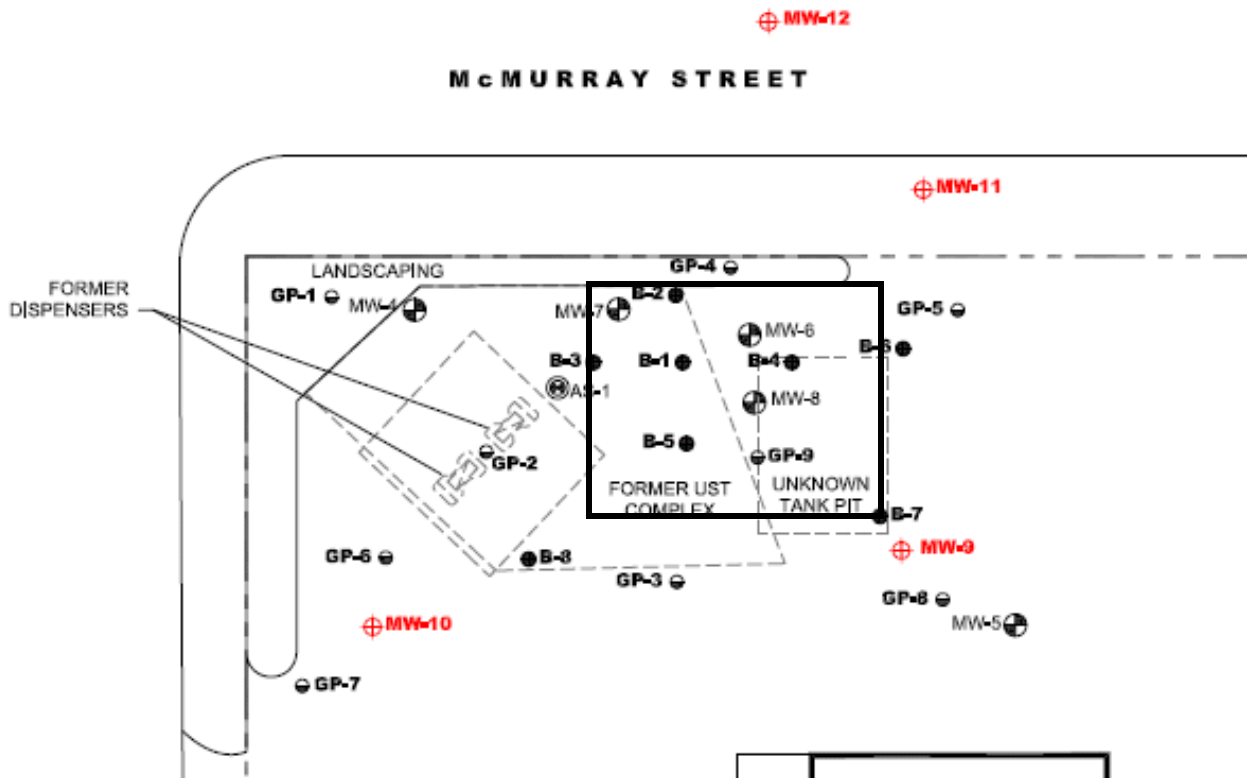


Figure 5. Expanded view of borehole area showing region of contamination (solid box). Region is approximately 42' x 30'. Approximate depth of contamination is approximately 12 to 17 bgs (5 Feet). Estimated total contaminated soil is 233 cubic yards.

TABLE 1
GROUNDWATER MONITORING AND ANALYTICAL RESULTS
7-Eleven Store No. 25821
1824 George Washington Way, Richland, Washington
All results in micrograms per liter (µg/L), except where noted

Well ID (TOC)	Sample Date	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-G	EDB	EDC	MTBE	Lead	Depth To Groundwater (feet from TOC)	Groundwater Elevation (feet)	
MW-6 361.43	09/01/93	65.0	120.0	87.0	3,000	15,000	--	--	--	--	14.27	347.16	
	03/18/94	14.0	140.0	82.0	3,800	8,500	--	--	--	--	15.03	346.40	
	09/19/94	<3.0	120.0	140.0	4,700	43,000	--	--	--	--	14.35	347.08	
	03/02/95	14.0	38.0	33.0	1,500	15,000	--	--	--	--	15.21	346.22	
	08/09/95	<1.5	32.0	23.0	1,200	15,000	--	--	--	--	13.59	347.84	
	06/13/96	<0.5	1.2	3.2	155	3,000	--	--	--	--	6.63	348.61	
	12/11/96	3.2	7.1	11.2	387	4,000	--	--	--	--	3.75	347.85	
	06/24/97	<2.50	<2.50	6.4	211	2,040	--	--	--	--	2.58	12.32	349.11
	12/30/97	17.1	<2.50	49.7	695	9,770	--	--	--	--	2.47	15.54	345.89
	04/01/98	28.0	44.5	328.0	5,370	29,700	--	--	--	--	--	15.90	345.53
	06/25/98	1.9	19.0	120.0	2,200	7,700	--	--	--	--	8	15.25	346.18
	09/24/98	54.5	66.6	202.0	2,150	8,680	--	--	--	--	--	15.23	346.20
	12/15/98	<3	525.0	56	6,500	25,000	--	--	--	--	13	15.79	345.64
	03/31/00	<5	23.0	82	2,900	24,000	--	--	--	--	25	15.85	345.58
	06/13/00	<0.5	<0.5	88	2,500	19,000	--	--	--	--	--	15.26	346.17
	09/13/00	<50	<50	<50	1,100	19,000	--	--	--	--	--	15.78	345.65
	10/25/00	--	--	--	--	--	--	--	--	--	--	15.33	346.10
	11/22/00	--	--	--	--	--	--	--	--	--	--	15.54	345.89
	04/24/01	<25	<25	560	4,900	22,000	--	--	--	--	--	16.23	345.20
	11/02/01	<12	19.0	210	1,200	10,000	--	--	--	--	--	16.63	344.80
	03/07/02	<0.5	8.6	83.6	432	11,900	--	--	--	--	--	16.48	344.95
	05/31/02	3.5	3.3	155	889	6,610	--	--	--	--	--	16.09	345.34
	09/13/02	4.5	4.3	252	907	10,600	--	--	--	--	--	15.66	345.77
	12/13/02	<0.5	<1.0	227	889	8,220	--	--	--	--	--	16.16	345.27
	03/20/03	23.0	5.9	370	1,940	26,000	--	--	--	--	--	16.50	344.93
	06/06/03	4.0	4.0	10.0	10.0	1,000	--	--	--	--	--	16.19	345.24
	09/18/03	4.8	4.0	240	1,020	9,300 ⁽⁶⁾	--	--	--	--	--	16.43	345.00
	12/04/03	Seen Observed										16.81	344.62
	04/02/04	<1.0	<1.0	150	1,260	8,900	--	--	--	--	--	17.12	344.31
	06/29/04	3.8	1.1	110	940	8,300	--	--	--	--	--	16.50	344.93
	10/06/04	3.1	1.3	300	1,620	16,000	--	--	--	--	--	16.80	344.63
	12/23/04	3.6	<1.0	210	1,190	9,900	--	--	--	--	--	17.34	344.09
	04/07/05	<1.0	<1.0	<1.0	<2.0	920	--	--	--	--	--	16.21	345.22
	06/21/05	<1.0	2.2	1	<2.0	330	--	--	--	--	--	17.91	343.52
	09/21/05	<1.0	<1.0	<1.0	<2.0	<100	--	--	--	--	--	16.41	345.02
	11/22/05	--	--	--	--	--	--	--	--	--	--	18.04	343.39
	02/06/06	3.8	<1.0	110	400	6,300	--	--	--	--	--	17.11	344.32
	05/30/06	7.9	<1.0	130	770	7,500	--	--	--	--	--	16.85	344.58
	08/14/06	5.4	<1.0	<1.0	1.3	720	--	--	--	--	--	17.68	343.75
	11/07/06	14	290	1,300	7,600	35,000	--	--	--	--	--	14.26	347.17
04/10/07	12	<4.0	260	1,200	13,000	--	--	--	--	--	16.11	345.32	
06/05/07	11	<4.0	140	540	7,600	--	--	--	--	--	15.84	345.59	
09/27/07	9.0	<10	620	3,300	20,000	--	--	--	--	--	15.93	345.50	
12/07/07	5.5	<4.0	280	1,290	9,200	--	--	--	--	--	16.42	345.01	
06/11/08	12	<10	250	940	11,000	--	--	--	--	--	16.03	345.40	
10/29/08	7.3	<4.0	240	1,040	9,000	--	--	--	--	--	16.01	345.42	
04/13/09	9.0	<4.0	75	198	5,300	--	--	--	--	--	16.15	345.28	
10/22/09	5.5	<4.0	90	206	3,800	--	--	--	--	--	16.07	345.36	
04/07/10	<0.4	<2.0	52	97	2,600	<0.0096 ^q	<0.40	<0.40	--	--	16.67	344.76	
12/16/10	<0.50	<0.50	73	240	5,300	--	--	--	--	--	16.10	345.33	
03/08/11	<0.50	<0.50	42	140	3,600	--	--	--	--	--	16.15	345.28	

Sample ID	Sample Date	Depth (feet bgs)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-G	TPH-D	TPH-O
MW-7-B	7/25/1998	5-10	<0.05	<0.05	<0.05	<0.10	<5.0	--	--
MW-7-C	7/25/1998	13-14	<0.05	<0.05	<0.05	<0.10	<5.0	--	--
B1-16	12/27/2000	16	12	22	27	>50	4600	--	--
B1-18	12/27/2000	18	<0.05	<0.05	<0.05	<0.05	<10	--	--
B2-16	12/27/2000	16	11	19	23	>50	3800	--	--
B3-16	12/27/2000	16	4	16	12	23	3700	--	--
B3-18	12/27/2000	18	<0.05	<0.05	<0.05	<0.05	<10	--	--
B4-16	12/27/2000	16	4.2	6.6	10	35	3000	--	--
B4-18	12/27/2000	18	<0.05	<0.05	<0.05	<0.05	<10	--	--
B5-16	12/27/2000	16	2.6	6.6	5.5	30	1100	--	--
B5-18	12/27/2000	18	<0.05	<0.05	<0.05	<0.05	<10	--	--
B6-12	12/27/2000	12	<0.05	0.34	<0.05	45	1400	--	--
B6-16	12/27/2000	16	<0.05	0.2	0.94	7.8	150	--	--
B7-12	12/27/2000	12	<0.05	<0.05	<0.05	<0.05	<10	--	--
B7-16	12/27/2000	16	4.8	28	27	>50	3900	--	--
B8-16	12/27/2000	16	<0.05	<0.05	<0.05	<0.05	<10	--	--
GP-1@5	7/9/2004	5	<0.011	<0.055	<0.055	<0.11	<5.5	<280	1300
GP-1@10	7/9/2004	10	<0.011	<0.053	<0.053	<0.106	<5.3	<26	<53
GP-1@16	7/9/2004	16	<0.011	<0.054	<0.054	<0.108	<5.4	<27	<54
GP-2@5	7/9/2004	5	<0.011	<0.054	<0.054	<0.108	<5.4	<27	<54
GP-2@10	7/9/2004	10	<0.011	<0.055	<0.055	<0.11	<5.5	<28	<55
GP-2@15	7/9/2004	15	<0.011	<0.055	<0.055	<0.11	<5.5	<28	<55
GP-2@18	7/9/2004	18	<0.011	<0.054	<0.054	<0.108	<5.4	<27	110
GP-3@5	7/9/2004	5	<0.011	<0.055	<0.055	<0.11	<5.5	<28	210
GP-3@10	7/9/2004	10	<0.011	<0.057	<0.057	<0.114	<5.7	<28	<57
GP-3@12	7/9/2004	12	<0.011	<0.056	<0.056	<0.112	<5.6	<140	670
GP-4@5	7/9/2004	5	<0.010	<0.052	<0.052	<0.104	<5.2	<26	<52
GP-4@10	7/9/2004	10	<0.011	<0.056	<0.056	<0.112	<5.6	<140	500
GP-4@15	7/9/2004	15	<0.011	<0.054	<0.054	<0.108	<5.4	<27	<54
GP-5@10	7/9/2004	10	<0.010	<0.052	<0.052	<0.104	<5.2	<26	<52
GP-5@14	7/9/2004	14	<0.013	<0.063	<0.063	<0.126	<6.3	<31	<63
GP-6@5	7/9/2004	5	<0.011	<0.056	<0.056	<0.112	<5.6	<28	<56
GP-6@10	7/9/2004	10	<0.011	<0.056	<0.056	<0.112	<5.6	57	91
GP-6@12	7/9/2004	12	<0.011	<0.056	<0.056	<0.112	<5.6	440	<56
GP-7@5	7/9/2004	5	<0.012	<0.060	<0.060	<0.12	<6.0	<30	<60
GP-7@10	7/9/2004	10	<0.010	<0.052	<0.052	<0.104	<5.2	<26	<52
GP-7@12	7/9/2004	12	<0.011	<0.054	<0.054	<0.108	<5.4	<27	<54
GP-8@5	7/9/2004	5	<0.011	<0.054	<0.054	<0.108	<5.4	<27	<54
GP-8@10	7/9/2004	10	<0.011	<0.053	<0.053	<0.106	<5.3	<26	<53
GP-9@5	7/9/2004	5	<0.011	<0.055	<0.055	<0.11	<5.5	<28	<55
GP-9@10	7/9/2004	10	<0.011	<0.056	<0.056	<0.112	<5.6	<28	<56
GP-9@14	7/9/2004	14	<0.011	<0.054	<0.054	<0.108	<5.4	<27	<54
MTCA Method A Soil Cleanup Levels			0.03	7	6	9	30 ¹	2000	2000

Table 2. Soil Borehole Data from 7-11 Store #25821. Table provided by Stantec (3). All units listed mg/kg.