SITE HAZARD ASSESSMENT WORKSHEET 1

Summary Score Sheet

SITE INFORMATION:

Name: **Olympic Pipe Line Co Allen Station**
Address: **16471 State Route 20**
City: **Mount Vernon** County: **Skagit** State: **WA** Zip: **98223**
Parcels: **P21435**
Section/Township/Range: **NE1/4 NW1/4 11/34N/03E**
Latitude: **48.4556 DD** Longitude: **-122.3901 DD**
FSID #: **2667**

Site scored/ranked for the August , 2010 update of the Site Register by Polly Dubbel, Skagit County Public Health Department June 25, 2010

SITE DESCRIPTION:

The Olympic Pipe Line Co (OPLC) Allen Station site is located in central Skagit County in the midst of the Skagit River 100 year flood plain. The Allen Station is a pumping station that receives diesel, gasoline, and jet fuel from the Tesoro Refinery located to the west on March Point in Anacortes and from BP Cherry Point Refinery located north of Bellingham in Whatcom County. The products are received through two high pressure 16" pipes coming from the west and north and exit the facility through two high pressure pipelines, 16" and 20", flowing south to a Renton Station. The facility was constructed in 1965 and is approximately three acres in size. OPLC also owns a vacant field adjacent to the west. This field will be referred to as the adjacent property. The term "site" will be used to define only P21435, the parcel containing the actual pump station features. Refer to Figures 1 and 1.2 for general vicinity maps.

In addition to the underground high pressure pipes and other historical pipes no longer in use, the site has several above ground features. An 84,000 gallon steel above ground storage tank (AST) is used to store fuel when the product in the lines is being changed. The tank is then slowly emptied into the outgoing line when gasoline is running. The AST is surrounded by a soil and gravel berm but there is no confining layer in the berm or the underlying soil surrounding the tank. The tank basin is inspected monthly for signs of releases. Other site features include a 1500 gallon process sump, pipeline pumps with surrounding sound barrier, monitoring and control equipment. There are two large buildings on site, a control building and a storage building. A three sided shed with concrete floor houses moderate risk waste drums and some chemical products. The drums are over secondary containment. The south central portion of the site is occupied by a Puget Sound Energy substation. The majority of the ground surface at the site is unpaved gravel. Most site features are located within the gravel with limited areas of asphalt paved drives. OPLC has applied to Skagit County for permitting to add secondary containment to the AST along with some additional site paving. The site is intermittently staffed. The pump station property is entirely fenced.

The site is located just north of State Route 20 to the west of Avon Allen Road. Railroad tracks lie between the site and State Route 20. The land is flat flood plan, the Skagit River being just over a mile to the southeast. Soils are typical of the flood plain, sand and gravel with underlying silt intermingled with clay. The underlying aquifer is shallow and unconfined with seasonal fluctuation in flow generally between five and ten feet below ground surface. Two farms with residences are in close proximity to the site, one just to the south across State Route 20 and one adjacent to the northwest. Both of these farms are known to have wells. Farm fields are located to the south and west

of the site and single family residences lie to the east and north. An agricultural chemical supply facility is located to the east at the intersection of Avon Allen Road and State Route 20. The surrounding area is served by Skagit County PUD for drinking water but individual wells are still present in the area with uses likely for irrigation or stock watering but possible for drinking water. Properties are served either by on-site septic systems or, in the development to the north, by City of Burlington sewer. Indian Slough runs along the east side of the site flowing seasonally to Padilla Bay. The drainage ditch along the west side of the site would be expected to flow to Indian Slough to the west and south.

Environmental monitoring and reporting at the Allen Station is currently handled by Delta Environmental Consultants, Inc. (Delta). A history of chemical releases, remediation, and monitoring has been prepared by Delta in the report titled "Supplemental Soil and Groundwater Assessment, OPLC Allen Pump Station, 16471 WA State Route 20, Mount Vernon, Washington 98273" dated May 14, 2010. All available historical environmental assessments are copied and included in the Delta report as appendices; this information is briefly summarized below.

Historical records from OPLC document releases of gasoline and diesel at the Allen Station between the years 1973 and 1983 resulting in the equivalent of nearly 1600 barrels of petroleum product released to the ground. Recovery of about 1400 barrels was reported with these releases. No further documentation or reporting is available on this history or on releases prior to 1973.

On August 23, 1988 the largest spill documented at the site occurred when a 16 inch underground pipe ruptured spilling 4000 barrels of diesel to the ground surface, subsurface, and groundwater in the southwest corner of the property. Rittenhouse Zeman and Associates (RZA) was contracted to assist OPLC in response to the spill. Although no detailed report exists on the response, later reports from GeoEngineers document that an existing recovery trench starting at the southwest corner of the site and extending to the west (or possibly east, it is not clear in the records) along the southern boundary of the adjacent property was the main location of product recovery efforts. Vactor trucks were used to pump diesel from the trench. In addition, 20 recovery wells existed around the location of the spill and were also pumped. The total product recovery from the spill was given as 2300 barrels of diesel.

In September 1988 a soil/bentonite cutoff wall was constructed running from the southwest corner of the site to the north approximately 130 feet. The wall extended 8 feet below ground surface. From September 1988 and February 1989, 28 monitoring wells and 8 additional recovery wells were installed at the site. Data on groundwater and soil monitoring at the site is not documented until 1990. In 1989 RZA also reportedly sampled domestic water wells at the two farms located in close proximity to the site, immediately to the south across State Route 20 and adjacent to the northwest with no detection of total petroleum hydrocarbon at less than 1.0 mg/L. No laboratory data or written documentation of these samples from the time is available.

In a June 1990 letter to OPLC, RZA mentions the construction and backfilling of four trenches during March and April 1990. No information is provided on the size or location of these trenches or the purpose, although they were presumably for further product recovery and/or soil remediation. In letter RZA states that the excess soil from these trenches was placed on the adjacent property and the field was ripped, disced, and fertilized. RZA performed soil sampling in a portion of the field adjacent to the site and along the ditch (or the recovery trench?) that ran along the southern border of the adjacent property. Analysis with EPA Method 418.1 for Total Petroleum Hydrocarbons (TPH) showed significant contamination (over 2000 ppm) in surface and subsurface soil samples at two locations within the field and multiple locations along the southern edge of the ditch. The TPH results were not described in terms of gasoline or diesel components. In 1991 the original recovery trench was backfilled and a new trench dug 25 feet to the north. The current knowledge of this trench is that it is

a ditch dug 15 feet below ground surface backfilled with pit run. It is located between the pipelines coming from March Point and the railroad tracks. There is no liner or confining layer within the trench. An oil/water separator was installed at the western outfall of the trench prior to flow from the trench exiting off OPLC property to a surface water ditch.

No documentation of soil remediation exists for the site or adjacent property beyond what is briefly referred to above. Site evaluations via soil and groundwater sampling are documented in 1991 and 1992/1993. In 1991 RZA performed further limited sampling of subsurface soil and groundwater mainly at the adjacent property in the vicinity of the new recovery trench. GeoEngineers performed a more detailed subsurface evaluation of the site and the adjacent property between June 1992 and April 1993 with significant findings of TPH-Gasoline and BTEX in addition to TPH-Diesel in both groundwater and soil on the site and extending to the south and west on the adjacent property as well as to the south and north off of OPLC owned property. No further sample data or documentation of observation or pumping of recovery wells is provided until 2000.

In October 2000 GeoEngineers commenced quarterly groundwater monitoring of existing monitoring wells located around the site and just to the north of the recovery trench. Several monitoring wells along the south side of the railroad tracks west of the site and just to the south of the fenced area of the site had been decommissioned in July 2000. In October 2000 three wells were found to have free product. Samples from eight wells, two wells located in the southwest corner of the site, two wells from the central/north site, and four wells moving along the north side of the recovery trench, were analyzed for WTPH-G with BETX (benzene, ethyl benzene, toluene, and xylene) and WTPH-D. Gasoline and/or diesel range hydrocarbons were detected in all wells except the two furthest west at levels that exceeded MTCA (Model Toxics Control Act) Method A Clean Up Levels. BTEX were detected in the two wells in the southwest corner of the site and the two closest wells sampled in the adjacent property. Figure 2 is copied from GeoEngineers, 2001 to show the well locations and sample results from the 2000 monitoring.

Groundwater monitoring continued quarterly at the site from October 2000 for two years. Semi-annual groundwater monitoring occurred from 2003 through 2005 and one monitoring event was conducted in 2006. Delta, 2010 summarizes all of the groundwater monitoring results from 1992 to the present. Monitoring until 2005 focused on four on site wells, two located in the southwest portion of the site and two in the central west. Up to four additional existing wells were monitored in 2005 and after. These wells are located in the central, north central, and central west portions of the site. In 2005 Delta was contracted to arrange for the abandonment of eight of the existing monitoring wells and two recovery wells. No monitoring wells were present on the adjacent property after this abandonment. Since 2007 Delta has conducted quarterly or semi-annual groundwater monitoring of these wells.

Data from the routine groundwater monitoring of the above wells from 2000 to present shows significant contamination with TPH-Gasoline, TPH-Diesel, TPH-Oil, benzene and ethyl benzene in the wells in the southwest, central west, and central portion of the site. Many results greatly exceed MTCA Method A Clean Up Levels. Levels found during the routine monitoring vary significantly with season with the highest results during the summer monitoring. In addition to the routine monitoring for TPH and BTEX, in 2002 five of the wells showing significant petroleum contamination were screened for lead, EDB (ethylene dibromide), EDC (ethylene dichloride), MTBE (methyl tertiary butyl ether), cPAH (carcinogenic polyaromitic hydrocarbons) and other PAHs. MW-14, located along the central western border of the site, contained levels of total lead, benzo(a)pyene, and naphthalenes that exceeded MTCA Method Cleanup Levels. No subsequent monitoring included these analytes. In addition to the routine monitoring of existing groundwater wells, two additional site evaluations were conducted by Delta in 2007 and 2009.

In July 2007, prior to the alteration of the State Route 20 right of way, Delta conducted soil borings in 18 locations in order to better assess soil and groundwater contamination plumes. Five borings were made directly adjacent to State Route 20 along the north side of the highway due south of the central site and moving west to due south of the eastern adjacent property. Five borings were located in the central east to southeast portion of the adjacent property and eight borings were located throughout the site. Two soil samples were taken from each boring at depths of approximately 2.5' and 5' below ground surface. A groundwater sample was taken from each boring. All samples were analyzed for TPH-G, TPH-D, TPH-O, and BETX. Eight additional soil borings were conducted in August 2009 including three further to the west on the adjacent property, two along the northeast property line of the adjacent property, and two in the south central portion of the site. Soil samples from 5-6' below ground surface and groundwater samples were analyzed from each boring for the same parameters as 2007 with addition of total lead in soil. Figures 6, 7, 8, and 9 are copied from Delta 2010 and included with this report. The figures show the locations of the existing monitoring wells and 2007 and 2009 boring locations along with estimated plumes of contamination in soil and groundwater.

The 2007 and 2009 site evaluations as well as the routine groundwater monitoring at the Allen Station document continued high levels of soil and groundwater contamination with petroleum hydrocarbons. Subsurface soil in the central portion of the site and moving off site to the southwest and northwest is shown to be contaminated with TPH-G and TPH-D. Surface soil conditions have not been documented in any recent sample event. Groundwater contamination with benzene and TPH-G is present throughout the western 2/3 of the site and moving off site to the southwest (off site measurements of TPH-G range up to 6,200 ppb) and northwest (4,900 ppb TPH-G). Diesel contamination in groundwater is documented in slightly more limited areas but also moves off site to the southwest (18,100 ppb TPH-D) and northwest (39,100 ppb and 6,100 ppb TPH-D). Lead was not found in soil samples to any significant degree in the 2009 sampling.

On March 18, 2010 Corrina Marote and I conducted a site visit to the Allen Station in order to complete the Site Hazard Assessment. We met Neil Norcross of Olympic Pipe Line Company and Bryan Taylor of Delta on site. I found site features and conditions to be as described earlier in this report and as documented in Delta, 2010. The recovery wells still exist throughout the site and are checked quarterly but Bryan said only one (PW-4) continues to have product. The only area of visible surface contamination was surrounding the switch room, a small building located between the larger control and shop buildings. The asphalt on two sides of the building was heavily stained and there was a petroleum odor in the area. Neil did not have an explanation for the staining. Neil stated that no major releases (>5 gallons) have occurred on site since the 1988 spill. Bryan's review of records has shown that four spills have been reported to Ecology since 2000 with the highest release being 10 gallons.

The adjacent property remains undeveloped with the exception of some parking and pipe storage along the east line, but the gravel access road from Ovenell Road to the site now cuts across it from west to east. I questioned Neil and Bryan about the recovery trench draining to the oil/water separator at the west end of the adjacent property. Neither was aware of any monitoring or maintenance that occurs on the separator or if water routinely drains from the trench to the separator. Bryan stated that no surface water monitoring or monitoring of private wells in the area has occurred since 1989. We discussed the lack of monitoring wells along the north side of the site and Bryan confirmed that this was a drill free zone due to the presence of the pipelines.

The Allen Station site is scored for all contaminant routes. Significant groundwater contamination is well documented to be present at the site and moving off site. The extent of the plume has not been fully documented, particularly to the north/northwest. Large areas of subsurface soil remain contaminated with petroleum products exceeding MTCA Clean Up Levels. Surface soil contamination was documented in 1990 but no surface soil samples have been documented since.

Given this lack of data on surface soil, the visible staining and odor in an area on site, and the recovery trench that drains directly to surface water, the routes for surface water and air are also scored.

ROUTE SCORES:

Surface Water/Human Health:	**54.8**	Surface Water/Environmental:	**46.7**
Air/Human Health:	**11.4**	Air/Environmental:	**27.6**
Groundwater/Human Health:	**56.1**		

OVERALL RANK: 1

WORKSHEET 2
Route Documentation

1. **SURFACE WATER ROUTE**
   a. List those substances to be considered for scoring: Source: 2,3,4

      TPH-Gasoline (with benzene), TPH-Diesel, Ethylbenzene, Benzo(a)pyrene, Lead

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

      Substances documented present either in surface soil historically or in groundwater with potential to drain to surface water

   c. List those management units to be considered for scoring: Source 2,3,4

      Surface soil, contaminated subsurface soil and groundwater that may drain to surface water.

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

      Substances documented present either in surface soil historically or in groundwater with potential to drain to surface water

2. **AIR ROUTE**
   a. List those substances to be considered for scoring: Source: 2,3,4

      TPH-Gasoline, TPH-Diesel

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

      Substances documented present historically in surface soil, substances stored on site in AST, visible surface staining and odor from apparent diesel spill

   c. List those management units to be considered for scoring: Source: 2,3,4

      Surface soil

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

      Substances documented present historically in surface soil, substances stored on site in AST, visible surface staining and odor from apparent diesel spill

3. **GROUNDWATER ROUTE**
   a. List those substances to be considered for scoring: Source: 2,3,4

      TPH-Gasoline (with benzene), TPH-Diesel, Ethylbenzene, Benzo(a)pyrene, Lead

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

      Documented groundwater contamination with these substances exceeding MTCA Method A Clean Up Levels

   c. List those management units to be considered for scoring: Source: 2,3,4

      Contaminated groundwater

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

      Documented groundwater contamination with these substances exceeding MTCA Method A Clean Up Levels

WORKSHEET 4

Surface Water Route

1.0 SUBSTANCE CHARACTERISTICS

1.2 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	TPH-Gasoline (with benzene)	5	8	3306 (rat)	3	ND	-	A	0.029	5
2	Ethylbenzene	700	4	3500 (rat)	3	0.1	1	ND	ND	-
3	TPH-Diesel	160	4	490 (rat)	5	0.004	3	ND	ND	-
4	Benzo(a)pyrene	0.2	10	50 (rat)	10	ND	-	B2	12	7
5	Lead	5	8	ND	-	0.001	10	ND	ND	-

* *Potency Factor*

Source: 2,3,4,5

Highest Value: 10
(Max = 10)

Plus 2 Bonus Points +2

Final Toxicity Value: 12
(Max = 12)

1.2 Environmental Toxicity – Fresh Water

	Substance	Acute Water Quality Criteria		Non-Human Mammalian Acute Toxicity	
		(µg/L)	Value	(mg/kg)	Value
1	TPH-Gasoline (with benzene)	5300	2		
2	Ethylbenzene	32000	2		
3	TPH-Diesel	2300	2		
4	Benzo(a)pyrene	ND	-	50	10
5	Lead	82	6		

Source: 2,3,4,5

Highest Value: 10
(Max = 10)

1.3 Substance Quantity

Explain Basis: Number of drums released to ground surface from historical reports, estimate approximately 2000	Source: 2,4 **Value: 6** (Max = 10)

2.0 Migration Potential

		Source	Value
2.1	**Containment:** No containment **Explain basis:** Assume contaminated surface soil, no cover, no containment	1, 2,4	**10** (Max = 10)
2.2	**Surface Soil Permeability:** Gravel, sand	1,2,4	**1** (Max = 7)
2.3	**Total Annual Precipitation:** Mount Vernon 32.7"	4,6	**3** (Max = 5)
2.4	**Max 2yr/24hr Precipitation:** 1.5 – 2.0 inches	4	**2** (Max = 2)
2.5	**Flood Plain:** In 100 year flood plain	4,10	**2** (Max = 2)
2.6	**Terrain Slope:** 0-2%	1,4	**1** (Max = 5)

3.0 Targets

		Source	Value
3.1	**Distance to Surface Water:** <1000 feet	1,4,10	**10** (Max = 10)
3.2	**Population Served within 2 miles (see WARM Scoring Manual Regarding Direction):** √35,788=189	4,9,10,11	**75** (Max = 75)
3.3	**Area Irrigated by surface water within 2 miles :0.75√ 109**	4,7,10	**8** (Max = 30)
3.4	**Distance to Nearest Fishery Resource:** Skagit River 5681 feet	4,10	**3** (Max = 12)
3.5	**Distance to, and Name(s) of, Nearest Sensitive Environment(s):** Wetlands between 1000 and 2000 feet	4,10,12	**9** (Max = 12)

4.0 Release

Explain Basis: No documented release to surface water	Source: 1,2, 4 **Value: 0** (Max = 5)

WORKSHEET 5
AIR ROUTE

1.0 SUBSTANCE CHARACTERISTICS

1.1. Introduction (WARM Scoring Manual) – Please review before scoring

1.2 Human Toxicity

	Substance	Air Standard ($\mu g/m^3$)	Value	Acute Toxicity (mg/m^3)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
1	TPH-Gasoline	0.12	10	31947 (rat)	3	ND	-	A	0.029	5
2	TPH-Diesel	166.5	4	ND	-	ND	-	ND	ND	-

* *Potency Factor*

Source: 1,2,4,5
Highest Value: 10
(Max = 10)
Plus 2 Bonus Points -
Final Toxicity Value: 10
(Max = 12)

1.3 Mobility (Use numbers to refer to above listed substances)

	1.3.1 Gaseous Mobility	1.3.2 Particulate Mobility		
	Vapor Pressure(s) (mmHg)	Soil Type	Erodibility	Climatic Factor
1	95 value = 3			
2	.082 value = 1			

Source: 4,5
Value: 3
(Max = 4)

1.4 Final Toxicity/Mobility Value

TPH Gasoline: Toxicity 10 Mobility 3

Final Matrix Value: 15
(Max = 24)

1.5 Environmental Toxicity/Mobility

	Substance	Non-human Mammalian Inhalation Toxicity (mg/m^3)	Acute Value	Mobility (mmHg)	Value	Matrix Value
1	TPH-Gasoline	31947 (rat)	3	95	3	15
2	TPH-Diesel	ND	-	.082	1	-

Highest Environmental Toxicity/Mobility Matrix Value (from Table A-7) = **Final Matrix Value: 15**
(Max = 24)

1.6 Substance Quantity	
Explain Basis: Unknown, use default value = 1	Source: 1,2,4 **Value: 1** (Max = 10)

2.0 MIGRATION POTENTIAL

2.1	**Containment:** Documented subsurface soil contamination, no documentation of status of soil between 0-2'. Past spill to surface. Also, staining and odor are evident on paved surface within facility. Throughout most of site no surface evidence of contaminations seen so only partial score for migration potential assigned (5/10).	1,2,3,4	**5** (Max = 10)

3.0 TARGETS

		Source	Value
3.1	**Nearest Population:** < 500', two farm residences within 500 feet	1,4,10	**10** (Max = 10)
3.2	**Distance to [and name(s) of] nearest sensitive environment(s):** Wetlands between 1000 and 2000 feet	4,10,12	**6** (Max = 7)
3.3	**Population within 0.5 miles:** Est 139 buildings x 3 = 417, sq rt 417 = 20	4,10	**20** (Max = 75)

4.0 RELEASE

Explain Basis: No documented release to air.	**Value: 0** (Max = 5) Source: 1,2,4

WORKSHEET 6

Groundwater Route

2.0 SUBSTANCE CHARACTERISTICS

1.2 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	TPH-Gasoline (with benzene)	5	8	3306 (rat)	3	ND	-	A	0.029	5
2	Ethylbenzene	700	4	3500 (rat)	3	0.1	1	ND	ND	-
3	TPH-Diesel	160	4	490 (rat)	5	0.004	3	ND	ND	-
4	Benzo(a)pyrene	0.2	10	50 (rat)	10	ND	-	B2	12	7
5	Lead	5	8	ND	-	0.001	10	ND	ND	-

* *Potency Factor*

Source: 2,3,4,5

Highest Value: 10
(Max = 10)

Plus 2 Bonus Points? +2

Final Toxicity Value: 12
(Max = 12)

1.2 Mobility (use numbers to refer to above listed substances)

Cations/Anions [Coefficient of Aqueous Migration (K)] OR	Solubility (mg/L)
1=	1= 1800 value=3
2=	2= 150 value=2
3=	3= 30 value=1
4=	4=.0012 value=0
5= 0.1 to 1.0 value=2	5=

Source: 4,5

Value: 3
(Max = 3)

1.3 Substance Quantity (volume):

Explain basis: Estimate at least 2000 drums diesel and gasoline released to soil and groundwater based on historical reports	Source:2,4 **Value: 6** (Max=10)

3.0 MIGRATION POTENTIAL

		Source	Value
2.1	**Containment (explain basis):** Contaminated soil, no cap	1,2,3,4	10 (Max = 10)
2.2	**Net precipitation:** Sedro Woolley (5.6+6.4+5.4+4.2+4.7+3.3)-(.9+.5+.5+.4+.6+1.2) = 23.8"	4,6	3 (Max = 5)
2.3	**Subsurface hydraulic conductivity:** sand, silty sand > 10E -5 to 10E-3	2,4	3 (Max = 4)
2.4	**Vertical depth to groundwater:** Soil boring on site found groundwater at 6 feet bgs	2,4	8 (Max = 8)

4.0 TARGETS

		Source	Value
3.1	**Groundwater usage:** Private supply, alternative available	4,8,10	4 (Max = 10)
3.2	**Distance to nearest drinking water well:** <600 feet	4,8,10	5 (Max = 5)
3.3	**Population served within 2 miles: √ pop.** = √229 =15	4,8,10	15 (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles: (0.75)*√# acres** = 0.75 * √1018 = 24	4,7,10	24 (Max = 50)

5.0 RELEASE

	Source	Value
Explain basis for scoring a release to groundwater: Documented release to groundwater	2,3,4	5 (Max = 5)

SOURCES USED IN SCORING

1. Skagit County Health Department, Field Notes from Site Hazard Assessment Site Visit, March 2010.
2. Delta Environmental, Inc, Supplemental Soil and Groundwater Assessment, OPLC Allen Station 16471 WA State Route 20 Mount Vernon, Washington 98273, Volumes I and II, May 14, 2010 (appendices contain RZA report and GeoEngineers,1993 and 2000 referenced in text).
3. GeoEngineers, May 2003 Quarterly Groundwater Monitoring Allen Pump Station Olympic Pipe Line Company 1449 State Route 20 Burlington, WA, July 31, 2003.
4. Washington Department of Ecology, WARM Scoring Manual, April, 1992.
5. Washington Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January, 1992.
6. National Weather Service, Washington Climate Data.
7. Washington Department of Ecology, Water Rights Information System (WRIS), 1997.
8. Washington Department of Ecology, Well Logs, Washington State Well Log Viewer, March 2010.
9. Washington Department of Health, Public Water Supply Data, Sentry Database, June 2010.
10. Skagit County Mapping, SkagitView Version 5.0, June 2008.

11. Skagit County Public Health Department, Public Water System Source Location Data, November 2007.
12. US Fish and Wildlife Service, National Wetlands Inventory, Wetlands Mapper, June, 2010.


Figure 1
Olympic Pipe Line Co.
Allen Station
Map by Polly Dubbel from
SkagitView 2010 – all locations approximate,a erial photo from 2007
Allen Station
State Route 20
Indian Slough
N
Skagit River

Figure 1.2
Olympic Pipe Line Co.
Allen Station

Map by Polly Dubbel from SkagitView 2010 – all locations approximate, Aerial photo from 2007

Olympic Pipe Line Co. Allen Station – Site Hazard Assessment Photos

by Polly Dubbel from March 18, 2010

View to northwest

View to north of 84,000 G AST

Olympic Pipe Line Co. Allen Station – Site Hazard Assessment Photos

by Polly Dubbel from March 18, 2010

Containment basin of AST

Sound barrier around pumps

Olympic Pipe Line Co. Allen Station – Site Hazard Assessment Photos

by Polly Dubbel from March 18, 2010

Reducing agent ASTs

Containment basin of reducing agent AST

Olympic Pipe Line Co. Allen Station – Site Hazard Assessment Photos

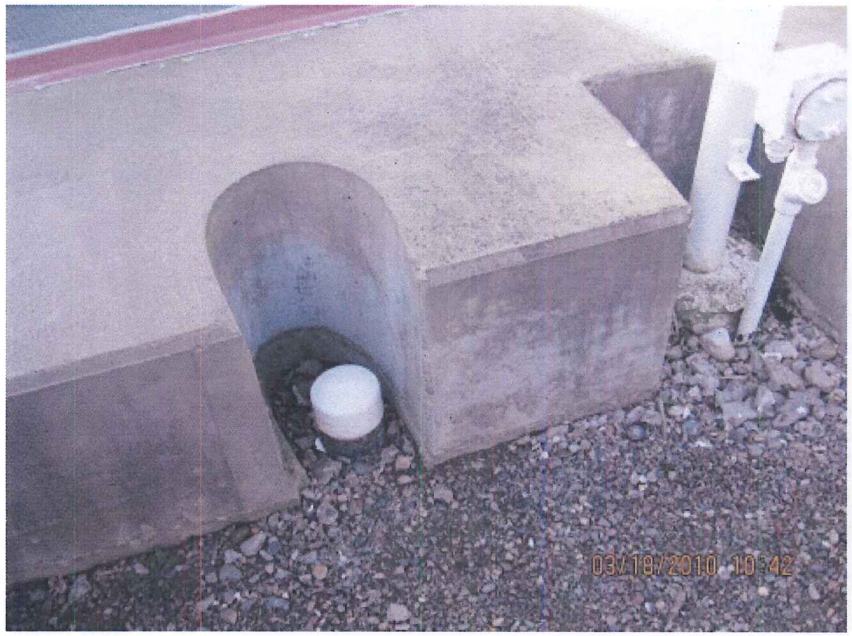
by Polly Dubbel from March 18, 2010

Northwest portion of site

Central site

Olympic Pipe Line Co. Allen Station – Site Hazard Assessment Photos

by Polly Dubbel from March 18, 2010



Recovery well

Pumps

Olympic Pipe Line Co. Allen Station – Site Hazard Assessment Photos

by Polly Dubbel from March 18, 2010

Pumps

Switch room, staining on ground

Olympic Pipe Line Co. Allen Station – Site Hazard Assessment Photos

by Polly Dubbel from March 18, 2010

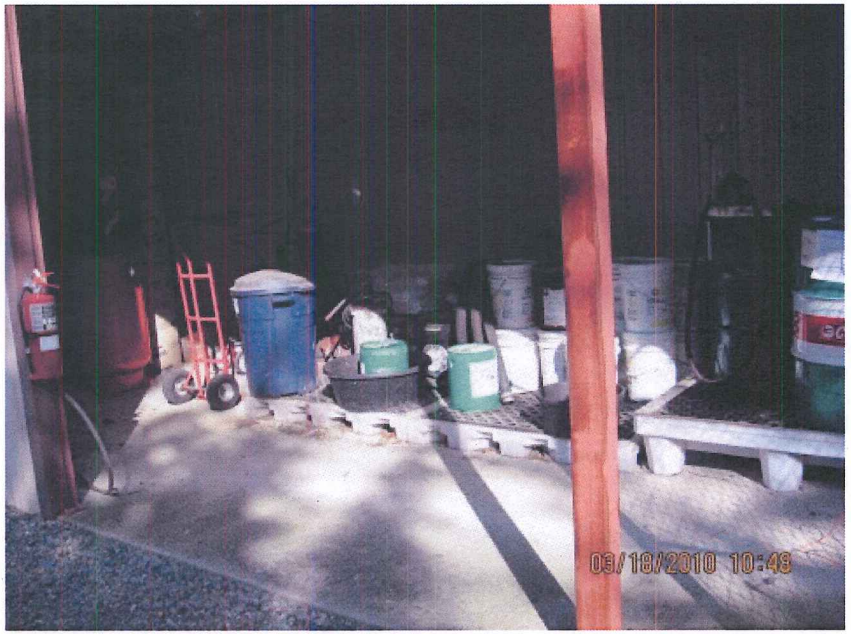
Northeast site

East site

Olympic Pipe Line Co. Allen Station – Site Hazard Assessment Photos

by Polly Dubbel from March 18, 2010

Storage building, east site



Dangerous waste and chemical storage

Olympic Pipe Line Co. Allen Station – Site Hazard Assessment Photos

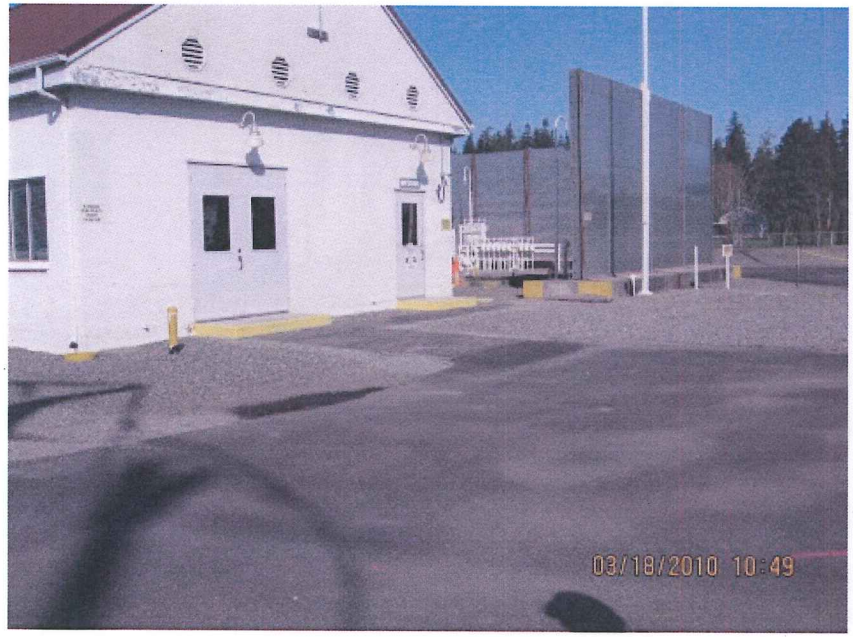
by Polly Dubbel from March 18, 2010

Dangerous waste and chemical storage

View along south side of control building looking west

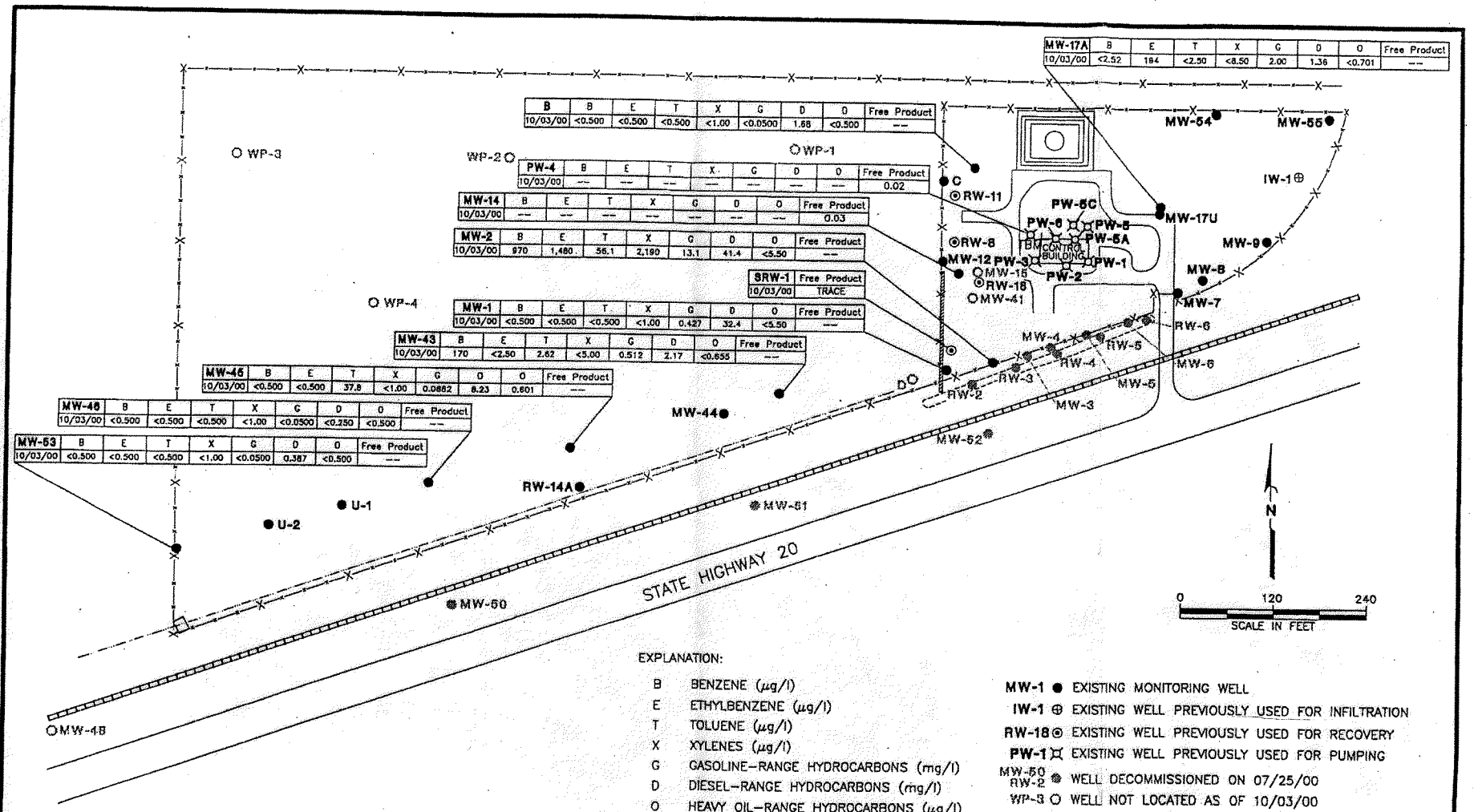
Olympic Pipe Line Co. Allen Station – Site Hazard Assessment Photos

by Polly Dubbel from March 18, 2010



East side of control building

Southwest site



EXPLANATION:

B	BENZENE (µg/l)
E	ETHYLBENZENE (µg/l)
T	TOLUENE (µg/l)
X	XYLENES (µg/l)
G	GASOLINE-RANGE HYDROCARBONS (mg/l)
D	DIESEL-RANGE HYDROCARBONS (mg/l)
O	HEAVY OIL-RANGE HYDROCARBONS (µg/l)
--	NONE MEASURED
µg/l	MICROGRAMS PER LITER
mg/l	MILLIGRAMS PER LITER

MW-1 ●	EXISTING MONITORING WELL
IW-1 ⊕	EXISTING WELL PREVIOUSLY USED FOR INFILTRATION
RW-18 ⊙	EXISTING WELL PREVIOUSLY USED FOR RECOVERY
PW-1 ⌑	EXISTING WELL PREVIOUSLY USED FOR PUMPING
MW-50 ❁	WELL DECOMMISSIONED ON 07/25/00
RW-2 ❁	
WP-3 ○	WELL NOT LOCATED AS OF 10/03/00
TBM ⊢	TEMPORARY BENCHMARK ON GROUND OUTSIDE NW CORNER OF CONTROL BUILDING: ASSUMED ELEVATION 100.00 FEET
—+—	FENCE

Notes: 1. The locations of all features shown are approximate. See Figure 1 for facility identification.

2. Free product thickness measurements are in feet.

Reference: Drawing entitled "Allen Station, OPLC Burlington, Washington," by Olympic Pipe Line Company, dated 10/14/88.

Geo Engineers

SUMMARY OF GROUND WATER ANALYTICAL DATA 10/03/00

FIGURE 2

IND:SYF P:\0894014\CAD\0894014O2E.DWG 02/09/01

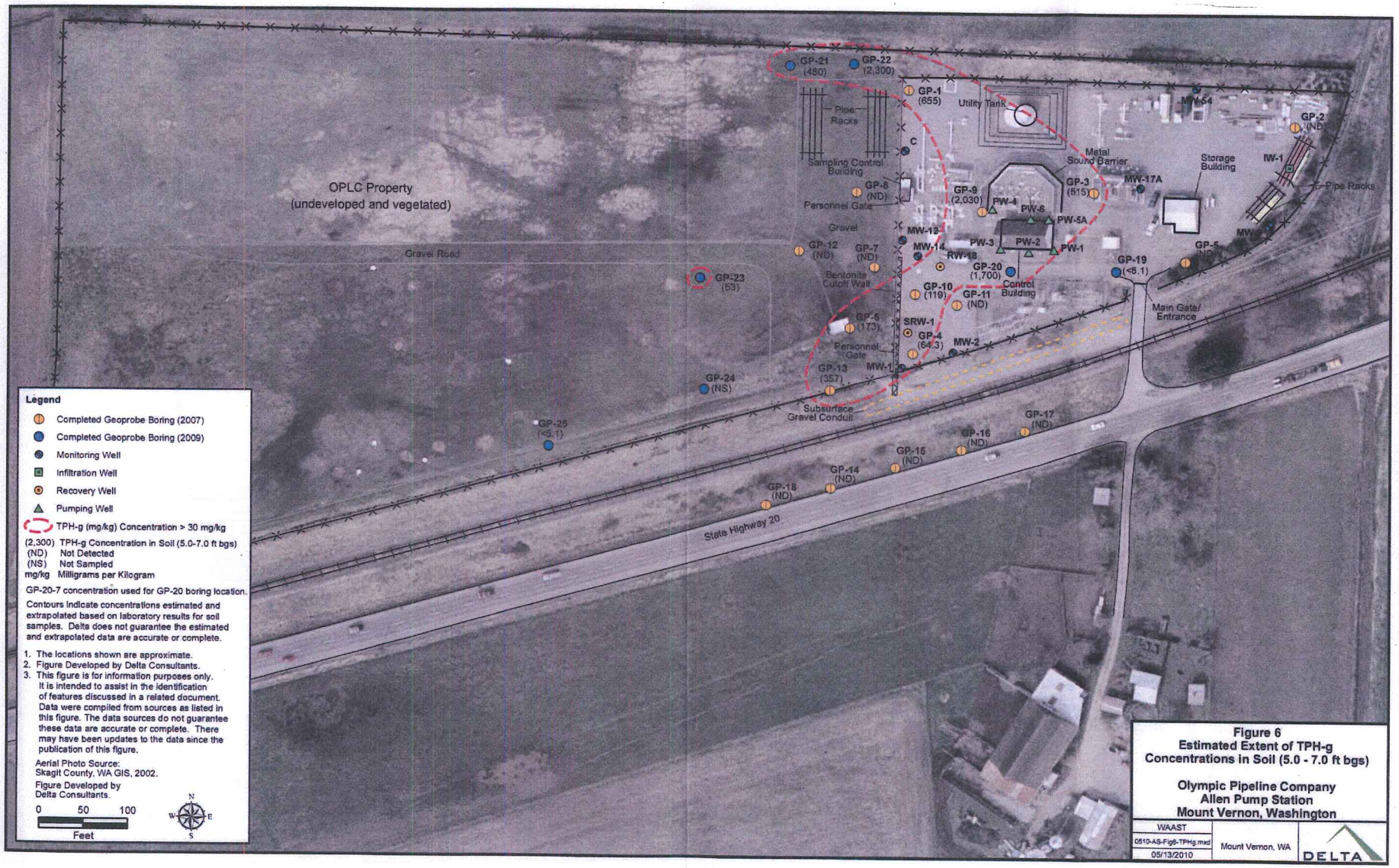


Figure 6
Estimated Extent of TPH-g Concentrations in Soil (5.0 - 7.0 ft bgs)

Olympic Pipeline Company
Allen Pump Station
Mount Vernon, Washington

WAAST	Mount Vernon, WA	DELTA
0510-AS-Fig6-TPHg.mxd		
05/13/2010		

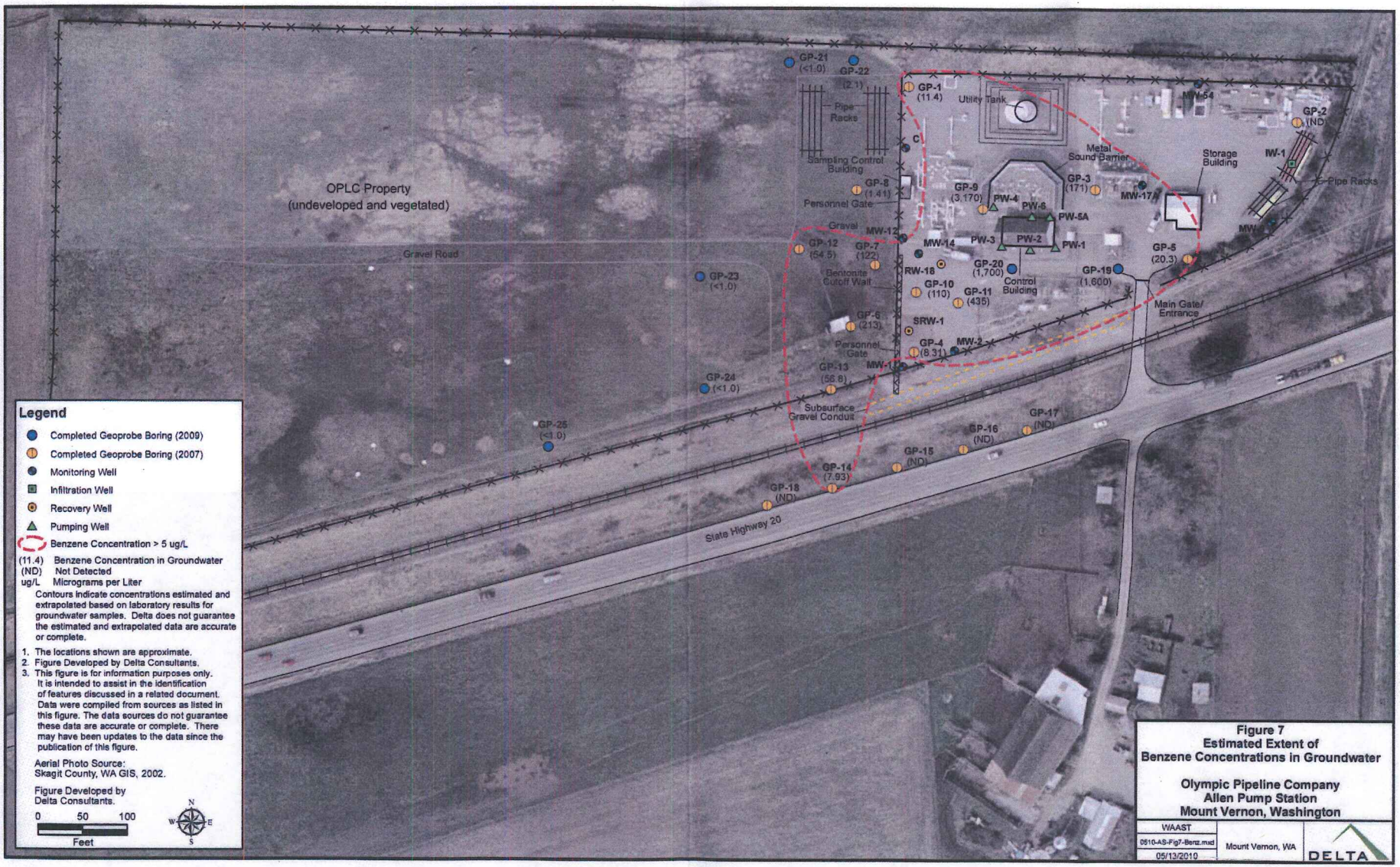
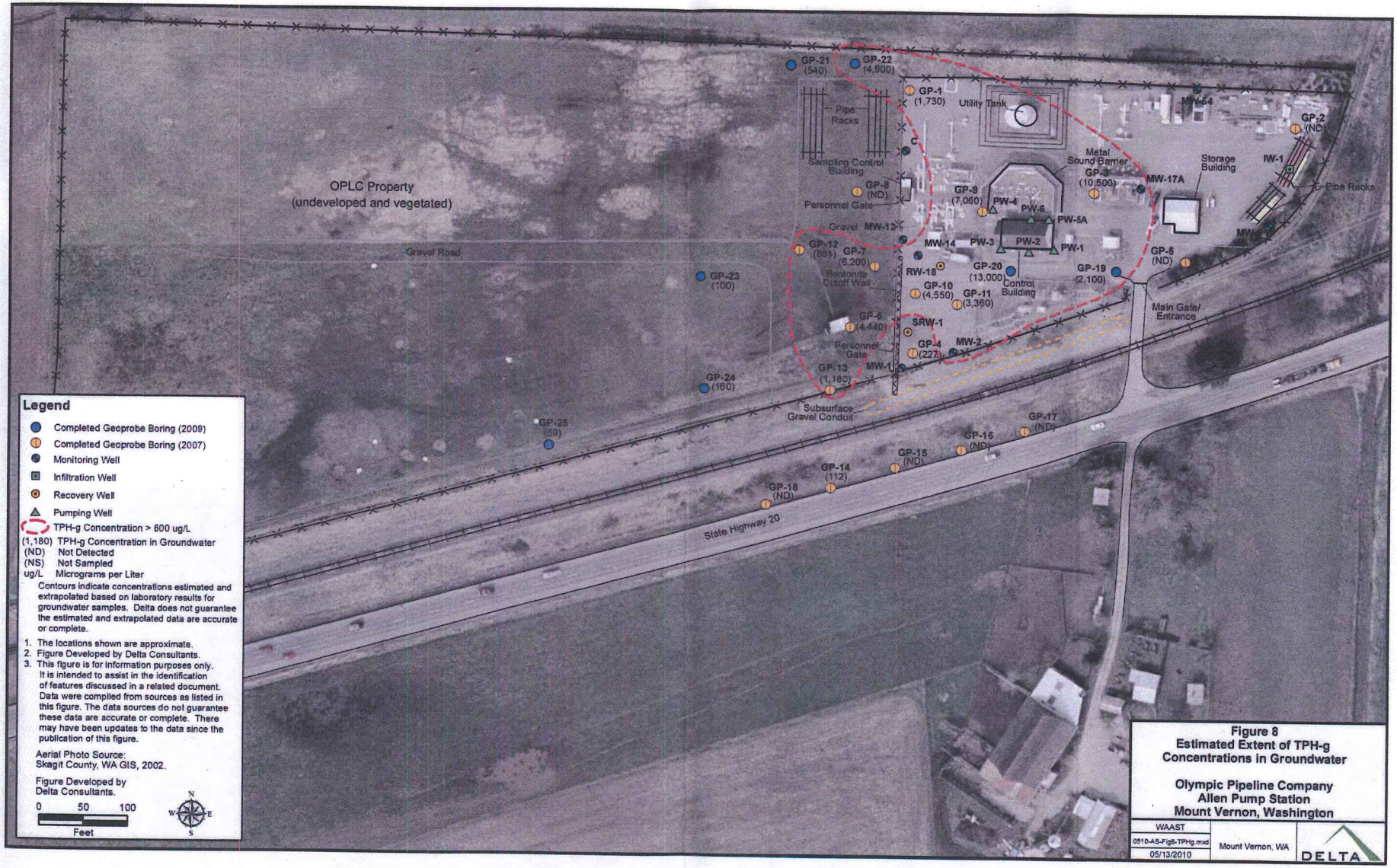


Figure 7
Estimated Extent of
Benzene Concentrations in Groundwater

Olympic Pipeline Company
Allen Pump Station
Mount Vernon, Washington

WAAST	Mount Vernon, WA	DELTA
0510-AS-Fig7-Benz.mxd		
05/13/2010		



Legend

- Completed Geoprobe Boring (2009)
- Completed Geoprobe Boring (2007)
- Monitoring Well
- Infiltration Well
- Recovery Well
- Pumping Well
- TPH-g Concentration > 600 ug/L

(1,180) TPH-g Concentration in Groundwater
(ND) Not Detected
(NS) Not Sampled
ug/L Micrograms per Liter

Contours indicate concentrations estimated and extrapolated based on laboratory results for groundwater samples. Delta does not guarantee the estimated and extrapolated data are accurate or complete.

1. The locations shown are approximate.
2. Figure Developed by Delta Consultants.
3. This figure is for information purposes only. It is intended to assist in the identification of features discussed in a related document. Data were compiled from sources as listed in this figure. The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure.

Aerial Photo Source:
Skagit County, WA GIS, 2002.

Figure Developed by
Delta Consultants.

0 50 100
Feet

N W E S

Figure 8
Estimated Extent of TPH-g Concentrations in Groundwater

Olympic Pipeline Company
Allen Pump Station
Mount Vernon, Washington

WAAST		
0510-AS-Fig8-TPHg.mxd	Mount Vernon, WA	DELTA
05/13/2010		

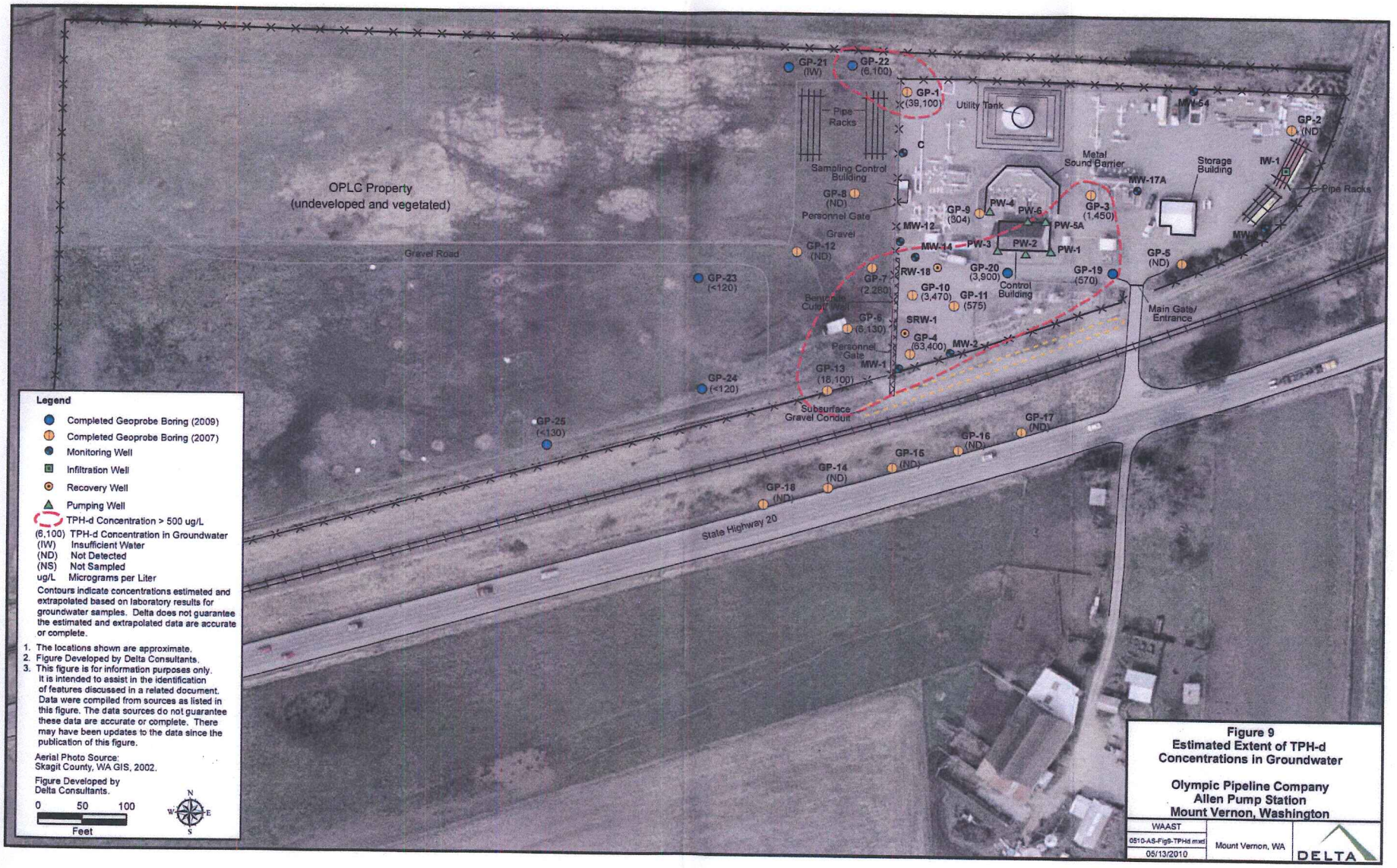


Figure 9
Estimated Extent of TPH-d Concentrations in Groundwater

Olympic Pipeline Company
Allen Pump Station
Mount Vernon, Washington

WAAST	Mount Vernon, WA	DELTA
0510-AS-Fig9-TPHd.mxd		
05/13/2010		