STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

November 13, 2013

Mr. Joe Stella
21603 NE 249th Avenue
Battle Ground, WA 98604

Re: Further Action at the following Site:

- **Site Name:** Chelatchie Prairie General Store
- **Site Address:** 42411 NE Yale Bridge Road, Amboy, WA 98601
- **Facility/Site No.:** 33415834
- **Cleanup Site ID No.:** 8754
- **VCP Project No.:** SW1327

Dear Mr. Stella:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your independent cleanup of the Chelatchie Prairie General Store facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

Issue Presented and Opinion

Is further remedial action necessary to clean up contamination at the Site?

YES. Ecology has determined that further remedial action is necessary to clean up contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70.105D RCW, and it's implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). The analysis is provided below.

Description of the Site

This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following releases:

- Petroleum constituents into the soil and groundwater.

Please note a parcel of real property can be affected by multiple sites. At this time, we have no information that the Property is affected by other sites.

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. Groundwater Monitoring & Closure Report, by 3 Kings Environmental, Inc., dated August 23, 2013.
2. Groundwater Investigation Report, by 3 Kings Environmental, Inc., dated April 4, 2004.
3. UST Closure Assessment, by W.F. Anderson Construction Company, Inc., dated June 23, 1993.

Those documents are kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. You can make an appointment by calling the SWRO resource contact at (360) 407-6365.

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis of the Cleanup

Ecology has concluded that **further remedial action** is necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

1. **Characterization of the Site.**

   Ecology has determined your characterization of the Site **is not** sufficient to establish cleanup standards and select a cleanup action.

   In May 1993, W.F. Anderson Construction Company, Inc. (Anderson) decommissioned three underground storage tanks (USTs) by excavation and removal. The three gasoline USTs that were removed consisted of an 8,000-gallon Super unleaded UST, an 8,000-gallon Regular unleaded UST, and a 12,000-gallon unleaded UST (Fig. 1). All three USTs were 18 years old at the time of decommissioning. The three gasoline USTs were purchased by Arnold Hatfield of Amboy, WA to be hauled away from the Site and dismantled for scrap at Schnitzer Steel Scrap in Portland, Oregon. Approximately 250 cubic yards of petroleum-contaminated soil (PCS) was excavated and placed on plastic on the owner's property. All PCS was transported to the Hillsboro Landfill in Oregon for disposal on August 6, 1993.

   On May 12, 1993 Anderson collected 11 soil samples (CP3G through CP13G) and two groundwater samples (CP14W and CP15W) for analysis (Fig. 1). The soil samples appear to only have been analyzed for gasoline (TPH-G) and the groundwater samples only for benzene, toluene, ethylbenzene, and xylene (BTEX). Soil sample CP5G showed a detection of TPH-G at 18 milligrams per kilogram (mg/Kg) (below the 30 mg/Kg MTCA Method A cleanup level) while all other soil sample results were below the laboratory detection levels (Fig. 2). No information regarding the depth that the samples were collected was found.

It appears that both groundwater samples were collected from within the former UST excavation so are most likely not representative of actual groundwater conditions at the Site. The analytical results are given in milligrams per liter (mg/L). The benzene result of 0.023 mg/L (CP14W) and 0.020 mg/L (CP15W) are both above the MTCA Method A cleanup level for benzene in groundwater of 5 micrograms per liter (µg/l) (Fig. 2).

On July 1, 1993, a 6,000-gallon diesel UST was removed across the street on property also under the same owner (Fig. 1). After removal and cleaning, the tank was taken to Anderson's property to be cut up for scrap. The tank appeared to be in good condition and no visual signs of contamination were present. On July 2, 1993, three soil samples (C1, C2, and C3) that had been collected around the diesel UST were submitted to the laboratory for analysis. The samples were only analyzed for TPH-D. All three soil samples were below the laboratory practical quantitation limit (PQL) of 25 mg/Kg which is below the current MTCA Method A Cleanup Level for diesel in soil of 2,000 mg/Kg (Fig. 2).

On July 1, 1993, two monitoring wells were installed on Site (Fig. 3). MW-1 was installed approximately 30 feet west of the dispenser island while MW-2 was installed approximately 10 feet west of the former UST cavity excavation west wall. The total depth of both wells was approximately 12 feet below ground surface (bgs). The wells were screened from a depth of 7 to 12 feet bgs. Four additional wells (MW-3 through MW-6) were allegedly installed on the Site sometime between 1993 and 2003. The file and report data is very confusing as to the exact date the wells were installed. MW-3, MW-4, MW-5, and MW-6 show sampling events beginning on October 22, 1999 (Fig. 4); however, the "Groundwater Investigation Report" by 3 Kings Environmental, Inc. (3 Kings), dated April 5, 2004, mentions MW-3 and MW-4 being constructed during the Site activities conducted beginning September 4, 2003.

On June 2, 2003, 3 Kings conducted a limited assessment at the Site. Eight soil borings were advanced to a depth of 15 feet bgs (Fig. 5). The borings were placed around the current UST location, current dispenser location, and the former UST and dispenser location. Groundwater was encountered at depths of 10 to 11 feet bgs. Pre-packed ¾-inch wells were installed to depths of 20 feet bgs with 15 feet of screen. Following well installation, the depth to water was estimated to be 16.2 feet bgs in MW-3 and 16.5 feet bgs in MW-4. The analytical results for the MW-3 sample collected on September 4, 2003 showed TPH-G at 15,000 µg/l and benzene at 14 µg/l (EPA Method 8021B) and 9 µg/l (EPA Method 8260). The TPH-G result was well above the current MTCA Method A cleanup level for groundwater of 800 µg/l with benzene detected. Benzene was also above the current MTCA Method A cleanup level for benzene in groundwater of 5 µg/l.

MW-3 was sampled again on September 16, 2003 but only for BTEX. All results were below the MTCA Method A cleanup levels for groundwater. On September 25, 2003, MW-3 was sampled for TPH-G with the result of 11,300 µg/l, still well above the 800 µg/l current cleanup level for TPH-G in groundwater. Due to the depth of groundwater during the September events, neither MW-1 nor MW-2 were sampled as both wells had only been completed to approximately 12 feet bgs and the wells were dry. MW-1 and MW-2 were sampled on January 4, 2004 for TPH-G and BTEX with all results below the current MTCA Method A cleanup levels.

Soil sample C4-10' had a TPH-G result of 518 mg/Kg, which is above the MTCA Method A cleanup level of 30 µg/l when benzene has been detected. Soil samples C6-11' and C7-11' had TPH-G results of 61 mg/Kg and 64 mg/Kg, respectively, which are also above the cleanup level. A groundwater sample collected from boring C4 and labeled C4-W had a TPH-G detection at 16,300 µg/l, well above the MTCA Method A cleanup level of 800 µg/l for TPH-G in groundwater.

In March 2007, 3 Kings implemented the introduction of chemical oxidation products to groundwater. 3 Kings placed slow-release Oxygen Release Compounds (ORC) within "socks" that were inserted in up gradient monitoring wells MW-1 and MW-2 and also introduced a slurry of ORC into MW-3 and MW-4 during a single event. MW-5 and MW-6 had been abandoned, although neither the exact date is known or whether the wells have been properly decommissioned. The last sampling event from MW-5 and MW-6 took place on September 13, 2002.

Groundwater sampling events took place on May 4, 2007, September 28, 2007, January 10, 2008, and June 30, 2008 (Fig. 4). MW-1 and MW-4 have had no detection of TPH-G or BTEX above the MTCA Method A cleanup levels for groundwater with the exception of TPH-G (1,800 µg/l) and benzene (100 µg/l) during the first sampling event on October 22, 1999. MW-2 showed TPH-G at 4,720 µg/l and benzene at 20 µg/l on May 4, 2007, both above their respective cleanup levels. TPH-G and benzene were not detected in the January 10, 2008 event; however, that well was not sampled on September 28, 2007 or June 30, 2008. MW-3 had a detection of TPH-G at 4,890 µg/l and benzene at 539 µg/l on May 4, 2007. For the next two events on September 28, 2007 and January 10, 2008, TPH-G and BTEX were all below the current cleanup levels. On June 30, 2008, TPH-G in MW-3 rebounded back to 1,810 µg/l, above the current cleanup level of 800 µg/l.

MW-3 is the most downgradient well located on the Site with the groundwater flow direction shown as being to the south-southwest. MW-3 has allegedly been sampled since 1999 with TPH-G results as high as 50,100 µg/l in June 2007 and benzene at 2,120 µg/l during that same event (Fig. 4).

On September 23, 2010, 3 Kings initiated compliance monitoring following completion of the ORC remediation project. Monitoring and sampling events were conducted on September 23 and December 31, 2010 and on March 30, June 27, and September 27, 2011. For those events, only MW-3 had an exceedance of TPH-G (1,030 µg/l) on September 23, 2010 exceeding the MTCA Method A cleanup level for TPH-G in groundwater (Fig. 4).

Based on a review of the above-listed reports, Ecology has the following comments:

1. The samples collected around the former diesel UST do not show what depth they were collected at and is not clear whether a sample was collected from beneath the UST or dispenser. The samples appear to only have been analyzed for TPH-D. A soil sample should be collected from a location that would be from at a depth below the location of the former diesel UST and dispenser location. Samples also need to be analyzed for the parameters listed in the MTCA

Cleanup Regulation 173-340-900 WAC Table 830-1 Required Testing for Petroleum Releases (Table 830-1). It has been stated that groundwater has varied between approximately 4 to 19 feet bgs at the Site. If any of the parameters sampled for diesel releases in Table 830-1 are found above the MTCA Method A cleanup level, a groundwater sample needs to be collected as well. If groundwater contamination is found, a minimum of three monitoring wells will need to be installed to determine the extent of contamination.

2. The gasoline USTs are mentioned as having been installed in the 1970s. This would most likely mean that leaded gasoline was sold there at one time. Samples need to be collected and analyzed for those parameters as required in Table 830-1.

3. The description of the monitoring well network, other than MW-1 and MW-2, does not make sense. The report submitted to Ecology by 3 Kings on August 23, 2013 mentions that "*Based on historic groundwater monitoring tables obtained by 3 Kings, it is likely that four additional wells (i.e. monitoring wells MW-3 through MW-6) were installed sometime between 1993 and 1999. Apparent groundwater monitoring initiated in October 1999 associated with six onsite wells.*" However; in the April 5, 2004 Groundwater Investigation Report, the construction of monitoring wells MW-3 and MW-4 is discussed as taking place on September 4, 2003.

4. There is a note in the Ecology file for this Site for a sampling event conducted by Ecology personnel Patti Martin and Jennifer Taylor on April 28, 2003. The note and subsequent entry in Ecology's database dated May 2003 states that there were only two wells installed at the Site at that time (Fig. 6).

5. The dates of construction for MW-5 and MW-6 is not mentioned other than sometime between 1993 and 1999. If they were in fact abandoned, supporting documentation needs to be provided that the wells were closed/decommissioned properly.

6. MW-3 is shown as the most downgradient well on Site and also has had the highest detection of TPH-G and benzene. A boring should be advanced downgradient of MW-3 to determine whether the plume extends further to the southwest. Both soil and groundwater samples should be collected. If groundwater contamination is detected, a permanent monitoring well should be installed and the extent of contamination will need to be determined.

7. Soil and groundwater samples must be analyzed for the applicable parameters listed in the MTCA Cleanup Regulation 173-340-900 Table 830-1 Required Testing for Petroleum Releases.

8. Please note that any document submitted containing geologic, hydrologic, or engineering work must be under the seal of an appropriately licensed professional, as required by Chapters 18.43 and 18.220 RCW.

9. In accordance with WAC 173-340-840(5) and Ecology Toxics Cleanup Program Policy 840 (Data Submittal Requirements), data generated for Independent Remedial Actions shall be submitted simultaneously in both written and electronic format. For additional information regarding electronic format requirements, see the website http://www.ecy.wa.gov/eim. Be advised that according to the policy, any reports containing sampling data that are submitted for Ecology review are considered incomplete until the electronic data has been entered. Please ensure that data generated during on-site activities is submitted pursuant to this policy. **Data must be submitted to Ecology in this format for Ecology to issue a No Further Action determination. Be advised that Ecology requires up to two weeks to process the data once it is received.**

10. In accordance with WAC 173-340-7490, a Terrestrial Ecological Evaluation (TEE) needs to be completed for the Site. Please fill out the TEE form (and supporting documentation as appropriate) and submit it to Ecology. The form can be found on our website at http://www.ecy.wa.gov/biblio/ecy090300.html.

2. Establishment of cleanup standards.

Ecology has determined the cleanup levels and points of compliance you established for the Site do not meet the substantive requirements of MTCA. MTCA Method A soil and groundwater cleanup levels for unrestricted land use are being used for the Site.

Standard points of compliance are being used for the Site. The point of compliance for protection of groundwater shall be established in the soils throughout the Site. For soil cleanup levels based on human exposure via direct contact or other exposure pathways where contact with the soil is required to complete the pathway, the point of compliance shall be established in the soils throughout the Site from the ground surface to 15 feet bgs. In addition, the point of compliance for the groundwater shall be established throughout the Site from the uppermost level of the saturated zone extending vertically to the lowest most depth that could potentially be affected by the Site.

Additional characterization is warranted prior to setting cleanup levels and establishing points of compliance.

3. Selection of cleanup action.

Ecology has determined the cleanup action you selected for the Site does not meet the substantive requirements of MTCA.

Cleanup actions at the Site to date have included UST removal, excavation and disposal of PCS, and use of ORC in MW-1, MW-2, MW-3, and MW-4. Since the Site has yet to be fully characterized, selection of a cleanup action is premature at this time.

4. **Cleanup.**

Ecology has determined the cleanup you performed does not meet any cleanup standards at the Site.

The source USTs have been removed and decommissioned. PCS has been excavated and disposed of at Hillsboro Landfill in Oregon.

Further investigation is needed consisting of soil and groundwater data collection to help determine the potential extent of residual contamination.

Limitations of the Opinion

1. **Opinion does not settle liability with the state.**

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040 (4).

2. **Opinion does not constitute a determination of substantial equivalence.**

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you performed is substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

3. **State is immune from liability.**

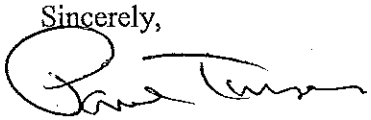
The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70.105D.030 (1) (i).

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm. If you have any questions about this opinion, please contact me by phone at (360) 407-6179 or e-mail at ptur461@ecy.wa.gov.

Sincerely,



Paul Turner, L.HG
SWRO Toxics Cleanup Program

PBT/ksc:Chelatchie SW1327 FA 11132013

Enclosures: A –Description and Aerial Photo of the Site
Fig. 1- Site Plan with 1993 Soil and Groundwater Sample Locations
Fig. 2- 1993 Soil and Groundwater Sample Results from1993
Fig. 3- Location of Monitoring Wells
Fig. 4- Groundwater Analytical Results
Fig. 5- Boring Locations and Sample Results 2003
Fig. 6- Field Note and Database Entry for Ecology 2003 Sampling Event

By certified mail: (7012 2210 0002 6581 1161)

cc: Mr. Bryan DeDoncker, Clark County Public Health
Mr. Brett MacDonald, 3 Kings Environmental, Inc
Dolores Mitchell - Ecology
Scott Rose - Ecology

Enclosure A

Description and Aerial Photo of the Site

The subject Site consists of a general store and retail fuel facility. The Site is located on a single 4.36-acre parcel, located at the northeast corner of the intersection of NE Yale Road (a.k.a. State Route 103) and NE Healy Road. The parcel is identified by the Clark County Assessor's Office as account number 274365000, within the Southeast Quarter of Section 12 of Township 5 North, Range 3 east of the Willamette Baseline and Meridian.

A single, 5,917 square-foot building, utilized as a convenience store, offices, storage, and restrooms exists on Site. The structure is located at the southwest corner of the Site. A single fuel island with two multi-product dispensers beneath a canopy is located on the west side of the property. Three USTs are currently operational. Ecology's database lists the three USTs as an 8,000-gallon unleaded gasoline tank, a 10,000-gallon unleaded tank, and a 10,000-gallon tank that is inaccurately listed as containing leaded gas. Approximately 10,000 square feet of the parcel is paved in an area roughly 100 feet by 100 feet that is used for customer and employee access and parking.

The Site is located sat approximately 160 feet above mean sea level, on a terrace of Chelatchie Creek. The nearest surface water body is Chelatchie Creek, located approximately ¼ mile west of the Site.

Enclosure A

Description and Aerial Photo of the Site

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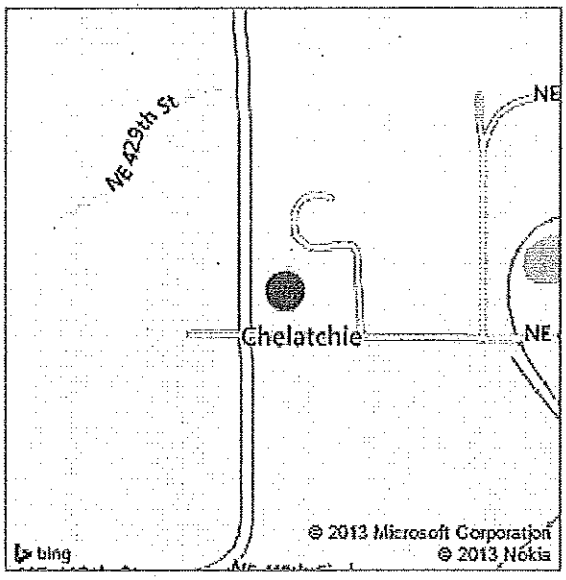
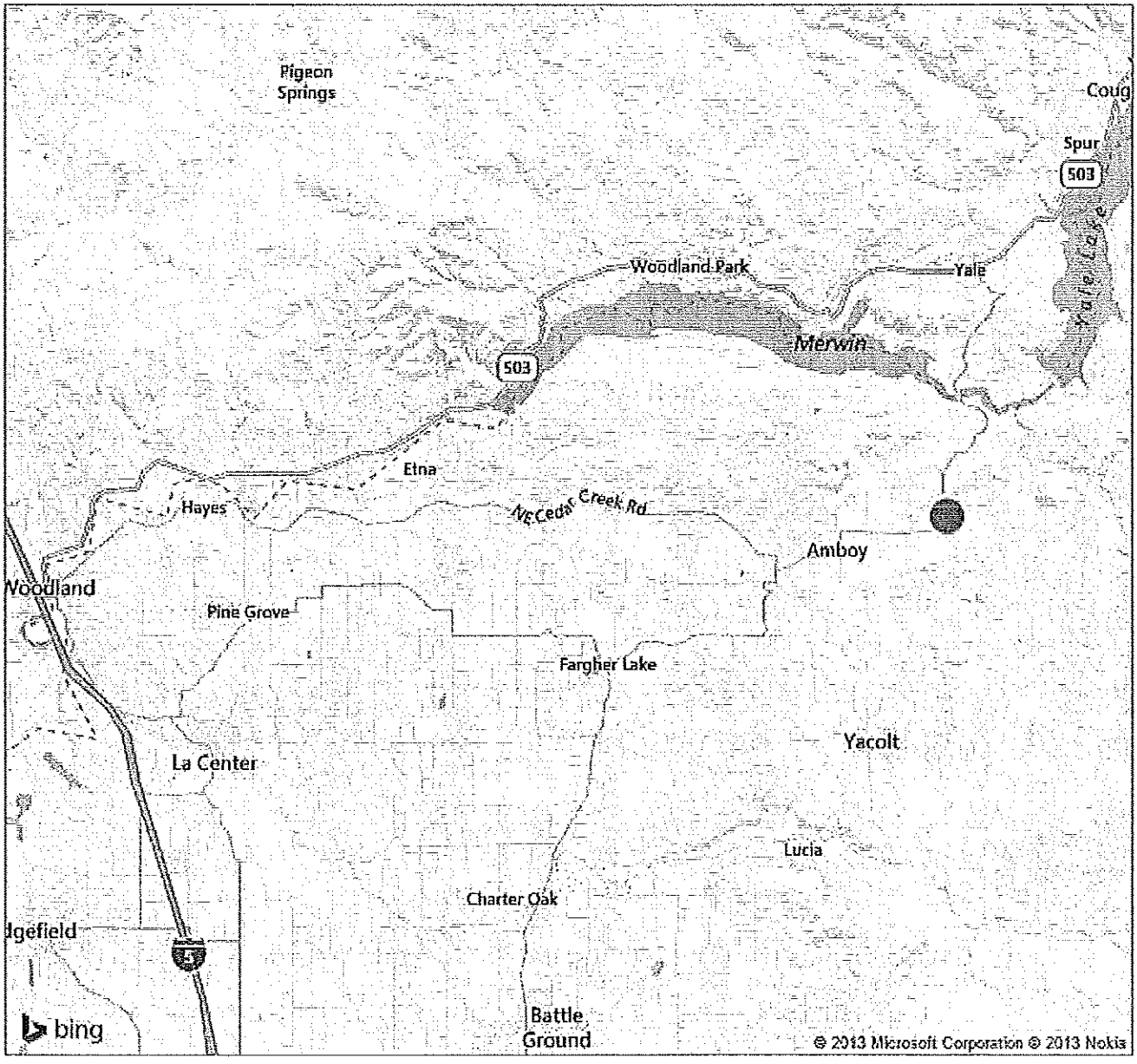
bing Maps

42411 NE Yale Bridge Rd, Amboy, WA 98601

My Notes

On the go? Use **m.bing.com** to find maps, directions, businesses, and more





bing Maps

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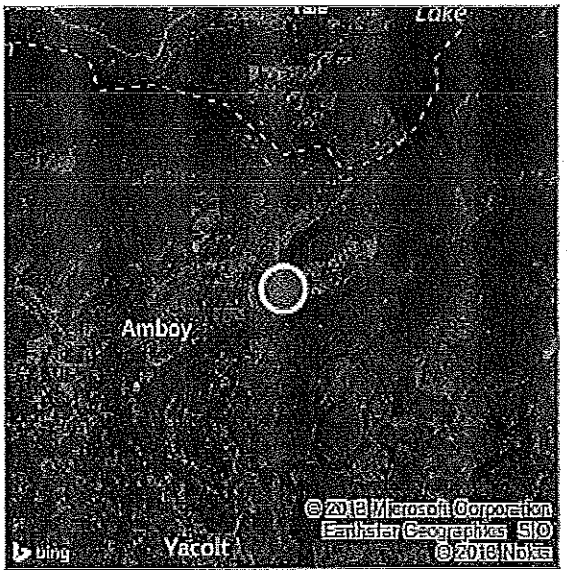
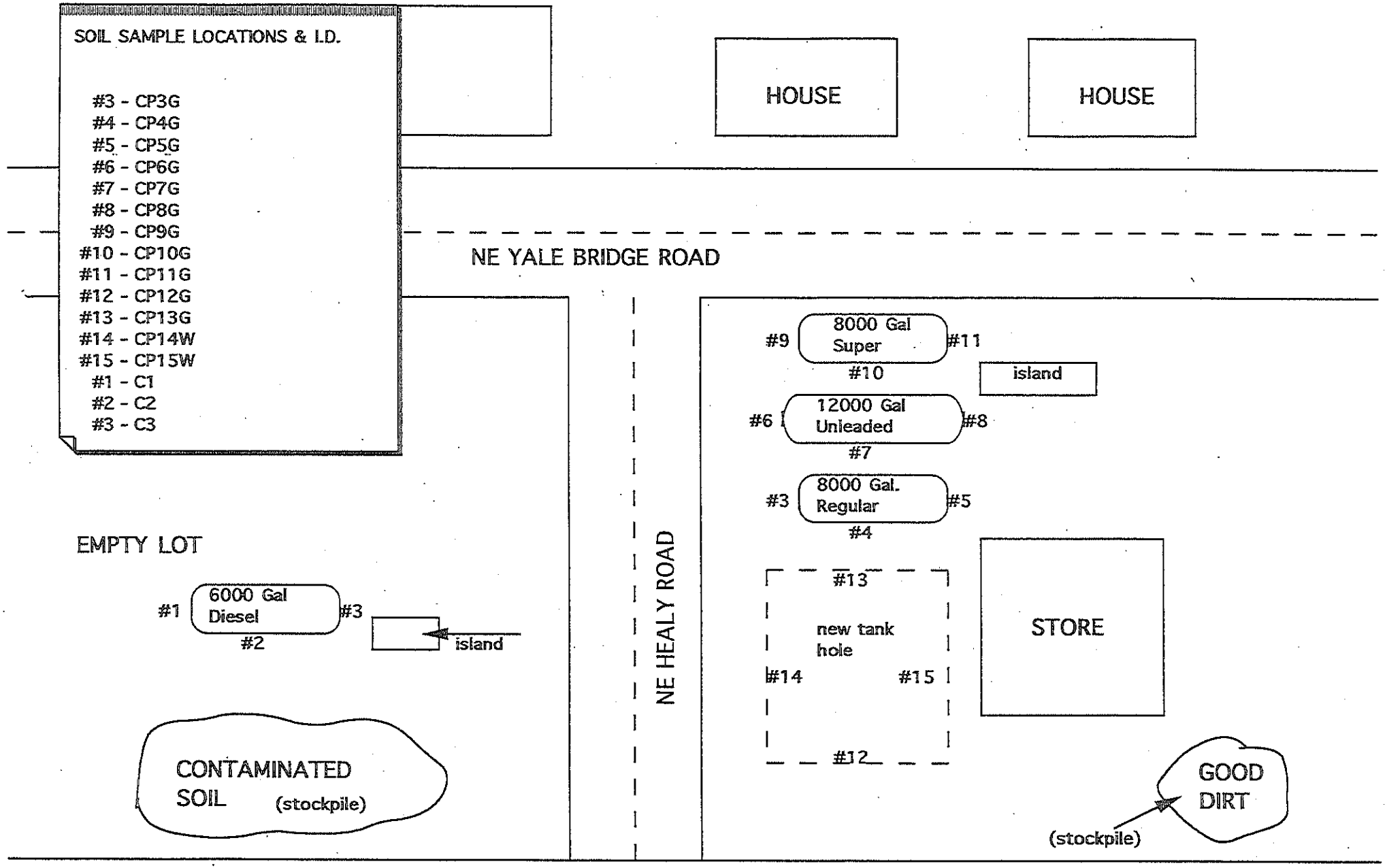


Figure 1

Site Plan with 1993

Soil and Groundwater Sample Locations



CHELATCHIE PRAIRIE GENERAL STORE - RT. 1 BOX 415 AMBOY, WA. 98601

JOE STELLA - OWNER/OPERATOR JOB# 9157

Figure 2

1993 Soil and Groundwater Sample Results

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: W. F. Anderson Construction Date: May 13, 1993

Report On: Analysis of Soil & Water Lab No.: 31995

IDENTIFICATION:
Samples received on 05-12-93
Project: Chelatchie

ANALYSIS:

WTPH-G
Date Extracted: 5-12-93
Date Analyzed: 5-12-93

Lab Sample No. 31995-1 Client ID: CP3G
Matrix: Soil

Parameter	Concentration, mg/kg	PQL	Flag
Gasoline (C7 - C12)	ND	1.0	
SURROGATE RECOVERY, %			
Trifluorotoluene	68		

Lab Sample No. 31995-2 Client ID: CP4G
Matrix: Soil

Parameter	Concentration, mg/kg	PQL	Flag
Gasoline (C7 - C12)	ND	1.0	
SURROGATE RECOVERY, %			
Trifluorotoluene	71		

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

W. F. Anderson Construction
Project: Chelatchie

Lab No. 31995
May 13, 1993

WTPH-G
Date Extracted: 5-12-93
Date Analyzed: 5-12-93

Lab Sample No. 31995-3 Client ID: CP5G
Matrix: Soil

Parameter	Concentration, mg/kg	PQL	Flag
Gasoline (C7 - C12)	18	1.0	X1

SURROGATE RECOVERY, %	
Trifluorotoluene	65

X1 = Aged Gasoline

Lab Sample No. 31995-4 Client ID: CP6G
Matrix: Soil

Parameter	Concentration, mg/kg	PQL	Flag
Gasoline (C7 - C12)	ND	1.0	

SURROGATE RECOVERY, %	
Trifluorotoluene	63

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . .

SOUND . NALYTICAL SERVI ES, INC.

W. F. Anderson Construction
Project: Chelatchie

Lab No. 31995
May 13, 1993

WTPH-G
Date Extracted: 5-12-93
Date Analyzed: 5-12-93

Lab Sample No. 31995-5 Client ID: CP7G
Matrix: Soil

Parameter	Concentration, mg/kg	PQL	Flag
Gasoline (C7 - C12)	ND	1.0	
SURROGATE RECOVERY, %			
Trifluorotoluene	59		

Lab Sample No. 31995-6 Client ID: CP8G
Matrix: Soil

Parameter	Concentration, mg/kg	PQL	Flag
Gasoline (C7 - C12)	ND	1.0	
SURROGATE RECOVERY, %			
Trifluorotoluene	53		

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

W. F. Anderson Construction
Project: Chelatchie

Lab No. 31995
May 13, 1993

WTPH-G
Date Extracted: 5-12-93
Date Analyzed: 5-12-93

Lab Sample No. 31995-7 Client ID: CP9G
Matrix: Soil

Parameter	Concentration, mg/kg	PQL	Flag
Gasoline (C7 - C12)	ND	1.0	
SURROGATE RECOVERY, %			
Trifluorotoluene	66		

Lab Sample No. 31995-8 Client ID: CP10G
Matrix: Soil

Parameter	Concentration, mg/kg	PQL	Flag
Gasoline (C7 - C12)	ND	1.0	
SURROGATE RECOVERY, %			
Trifluorotoluene	62		

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

W. F. Anderson Construction
Project: Chelatchie

Lab No. 31995
May 13, 1993

WTPH-G
Date Extracted: 5-12-93
Date Analyzed: 5-12-93

Lab Sample No. 31995-9 Client ID: CP11G
Matrix: Soil

Parameter	Concentration, mg/kg	PQL	Flag
Gasoline (C7 - C12)	ND	1.0	
SURROGATE RECOVERY, %			
Trifluorotoluene	71		

Lab Sample No. 31995-10 Client ID: CP12G
Matrix: Soil

Parameter	Concentration, mg/kg	PQL	Flag
Gasoline (C7 - C12)	ND	1.0	
SURROGATE RECOVERY, %			
Trifluorotoluene	60		

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

W. F. Anderson Construction
Project: Chelatchie

Lab No. 31995
May 13, 1993

WTPH-G
Date Extracted: 5-12-93
Date Analyzed: 5-13-93

Lab Sample No. 31995-11 Client ID: CP13G
Matrix: Soil

Parameter	Concentration, mg/kg	PQL	Flag
Gasoline (C7 - C12)	ND	1.0	

SURROGATE RECOVERY, %

Trifluorotoluene	59

Lab Sample No. 31995-12 Client ID: CP14W
Matrix: Water

BTEX by Method 8020
Date Analyzed: 5-13-93

Parameter	Concentration, mg/L	PQL	Flag
Benzene	0.023	0.001	
Toluene	0.21	0.001	
Ethyl Benzene	0.034	0.001	
Xylenes	0.37	0.001	

SURROGATE RECOVERY, %

Trifluorotoluene	77

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

W. F. Anderson Construction
Project: Chelatchie

Lab No. 31995
May 13, 1993

Lab Sample No. 31995-13 Client ID: CP15W
Matrix: Water

BTEX by Method 8020
Date Analyzed: 5-13-93

Parameter	Concentration, mg/L	PQL	Flag
Benzene	0.020	0.002	
Toluene	0.17	0.002	
Ethyl Benzene	0.028	0.002	
Xylenes	0.32	0.002	

SURROGATE RECOVERY, %

Trifluorotoluene	75

ND - Not Detected
PQL - Practical Quantitation Limit

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: W. F. Anderson Construction Date: July 13, 1993

Report On: Analysis of Soil Lab No.: 33219

IDENTIFICATION:
Samples received on 07-06-93
Project: Chelatchie

ANALYSIS:

WTPH-D
Date Extracted: 7-9-93
Date Analyzed: 7-10-93

Lab Sample No. 33219-1 Client ID: C1

Parameter	Concentration, mg/kg	PQL	Flag
Diesel (> C12 - C24)	ND	25	
SURROGATE RECOVERY, % o-terphenyl	81		

Lab Sample No. 33219-2 Client ID: C2

Parameter	Concentration, mg/kg	PQL	Flag
Diesel (> C12 - C24)	ND	25	
SURROGATE RECOVERY, % o-terphenyl	70		

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

W. F. Anderson Construction
Project: Chelatchie

Lab No. 33219
July 13, 1993

WTPH-D
Date Extracted: 7-9-93
Date Analyzed: 7-10-93

Lab Sample No. 33219-3 Client ID: C3

Parameter	Concentration, mg/kg	PQL	Flag
Diesel (> C12 - C24)	ND	25	
SURROGATE RECOVERY, %			
o-terphenyl	75		

ND - Not Detected
PQL - Practical Quantitation Limit

Figure 3

Location of

Monitoring Wells

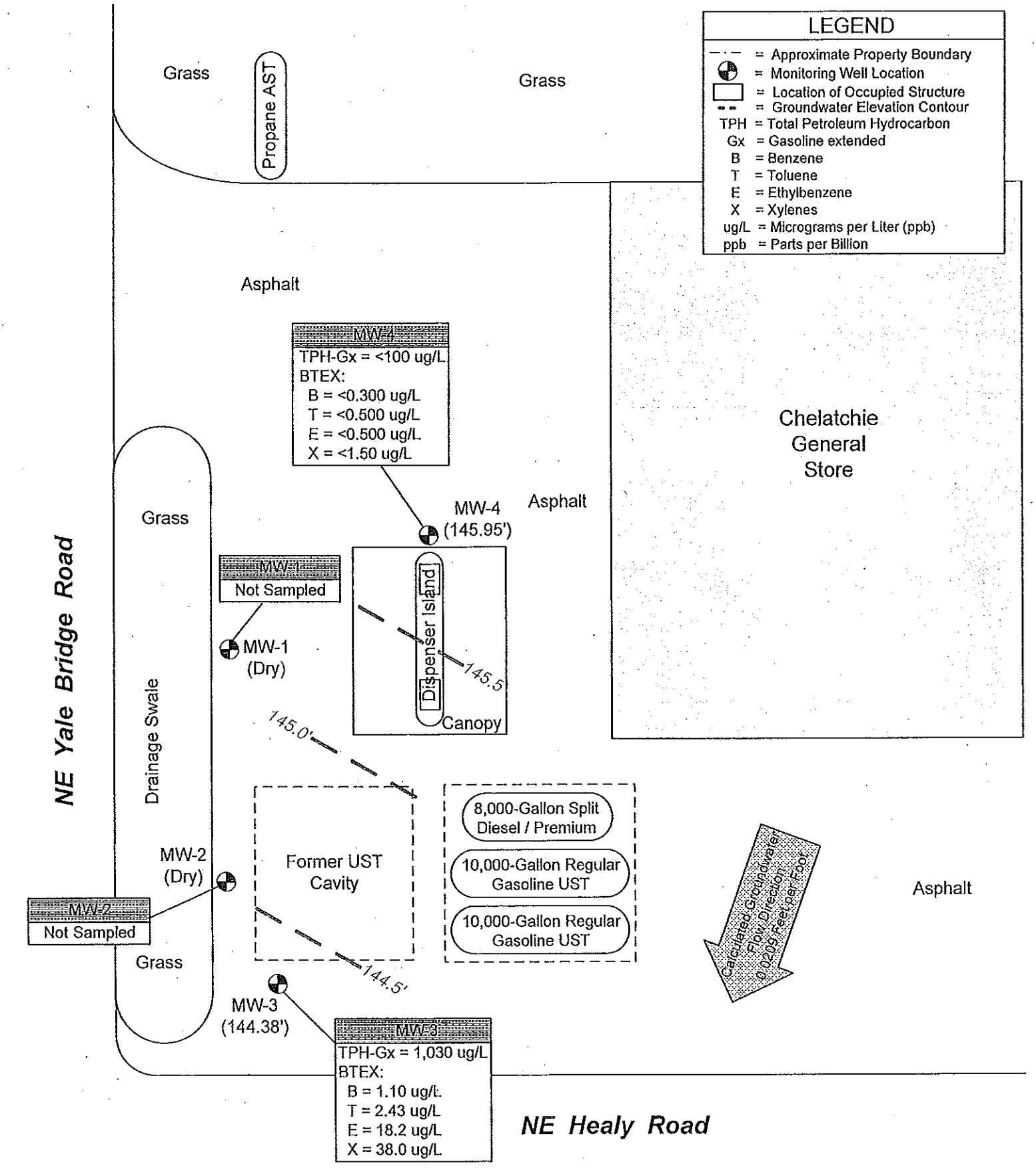


FIGURE 3: GROUNDWATER SAMPLE RESULTS, FLOW DIRECTION & GRADIENT MAP: THIRD QUARTER 2010

3 Kings Environmental, Inc.

Chelatchie General Store Closure Report
42411 NE Yale Bridge Road
Amboy, Washington
3 Kings Job Number: 27032

N

0 Scale 35

Figure 4

Groundwater Analytical Results

Groundwater monitoring was completed 12 times between 22 October 1999 and 30 June 2008. Monitoring activities included collection of water samples from each of the six onsite monitoring wells, with laboratory analysis for apparent Total Petroleum Hydrocarbon-Gasoline extended (TPH-Gx) and BTEX constituent analysis. Depth to shallow groundwater ranged from 4.98 to 16.39 feet below Top of Casing (TOC), and flow directions routinely calculated to the northeast.

The following table summarizes the results from the historic groundwater monitoring events.

Sample ID	Sample Date	TPH-Gx (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)
MW-1	10/22/1999	**1,800**	**100**	8	130	161
	01/12/2000	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
	05/24/2000	Not Detected	Not Detected	Not Detected	Not Detected	1.7
	11/07/2000	Not Detected	Not Detected	Not Detected	Not Detected	0.09
	06/27/2001	Not Detected	Not Detected	1	1	3
	02/27/2002	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	09/13/2002	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	05/05/2003	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
	05/04/2007	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
	09/28/2007	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled
	01/10/2008	Not Detected	Not Detected	1	Not Detected	Not Detected
	06/30/2008	158	Not Detected	Not Detected	Not Detected	Not Detected
MW-2	10/22/1999	200	**6.8**	0.8	8.6	10.2
	01/12/2000	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
	05/24/2000	**3,700**	**490**	58	3.4	628
	11/07/2000	**10,500**	**398**	34	434	323
	06/27/2001	**9,430**	**544**	47	**804**	662
	02/27/2002	**8,240**	**291**	35	424	453
	09/13/2002	436	Not Detected	Not Detected	Not Detected	Not Detected
	05/05/2003	**16,000**	**465**	30	Not Detected	960
	05/04/2007	**4,720**	**20**	24	165	163
	09/28/2007	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled
	01/10/2008	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	06/30/2008	Not Sampled	Not Sampled	Not Sampled	Not Sampled	Not Sampled
MW-3	10/22/1999	Not Detected	0.9	Not Detected	0.6	Not Detected
	01/12/2000	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
	05/24/2000	3.9	**1,150**	61	85	465
	11/07/2000	**8,420**	**1,322**	118	124	369
	06/27/2001	**50,100**	**2,120**	134	603	649
	02/27/2002	**4,610**	**705**	27	331	177
	09/13/2002	730	Not Detected	Not Detected	Not Detected	Not Detected
	05/05/2003	**5,450**	**338**	19	Not Detected	126
	05/04/2007	**4,890**	**539**	34	563	347
	09/28/2007	377	1	2	2	70
	01/10/2008	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	06/30/2008	**1,810**	Not Detected	1	3	7
MW-4	10/22/1999	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	01/12/2000	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
	05/24/2000	Not Detected	0.5	Not Detected	Not Detected	Not Detected
	11/07/2000	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	06/27/2001	477	Not Detected	Not Detected	56	2
	02/27/2002	159	1	Not Detected	Not Detected	Not Detected
	09/13/2002	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	05/05/2003	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
	05/04/2007	Not Detected	Not Detected	Not Detected	4	Not Detected
	09/28/2007	Not Detected	Not Detected	Not Detected	Not Detected	7
	01/10/2008	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	06/30/2008	155	Not Detected	Not Detected	Not Detected	Not Detected
Washington DOE MTCA Method A Cleanup Standards		**800**	**5**	**1,000**	**700**	**1,000**

Bold = Concentration exceeds applicable Washington DOE cleanup standard

Sample ID	Sample Date	TPH-Gx (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)
MW-5 *	10/22/1999	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
	01/12/2000	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	05/24/2000	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	11/07/2000	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
	06/27/2001	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
	02/27/2002	33	1	Not Detected	Not Detected	2
	09/13/2002	Not Detected	0.05	Not Detected	Not Detected	Not Detected
	05/05/2003	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
	05/04/2007	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
MW-6 *	10/22/1999	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
	01/12/2000	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	05/24/2000	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	11/07/2000	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	06/27/2001	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	02/27/2002	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	09/13/2002	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	05/05/2003	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
	05/04/2007	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Washington DOE MTCA Method A Cleanup Standards		**800**	**5**	**1,000**	**700**	**1,000**

Bold = Concentration exceeds applicable Washington DOE cleanup standard
* = Monitoring well decommissioned sometime after 4 May 2007.

A map illustrating the locations of the wells is available as Figure 2. See Appendix A for a cumulative groundwater sample result table.

Groundwater Remediation Activities:

In 2007, 3 Kings was utilized to introduce chemical oxidation products to groundwater beneath the subject site. Chemical oxidation was initiated in March 2007, and monitored four times over an approximate two-year period. 3 Kings placed slow-release Oxygen Release Compounds (ORC) within socks that were inserted in monitoring wells MW-1 and MW-2, and introduced an ORC slurry to monitoring wells MW-3 and MW-4 in a single event. It should be noted that former monitoring wells MW-5 and MW-6 were abandoned and presumably decommissioned sometime after 4 May 2007.

During chemical oxidation activities, groundwater monitoring was continued on an approximate semi-annual schedule. During remediation activities, groundwater ranged from 5.63 feet to 14.57 feet below TOC, with the deepest groundwater occurring during late-Summer and early-Fall. At times, monitoring wells MW-1 and MW-2 were found to be void of water, as these wells were completed to a depth of 13 feet and 12 feet bgs, respectively. Reportedly, monitoring wells MW-3 and MW-4 were completed to a depth of 20 feet bgs.

Concentrations of dissolved petroleum hydrocarbon constituents dropped from a concentration of 16,000 micrograms per liter, or parts per billion (ppb), for TPH-Gx in sample MW-2 on 5 May 2003 to 4,720 ppb on 4 May 2007 to non-detect on 10 January 2008. Additionally, concentrations of dropped from 465 ppb to non-detect in the same well, over the same period. Monitoring well MW-3 also exhibited similar reductions in TPH-Gx and benzene, dropping from