

Pugnetti Park: Soils and Groundwater Investigation, Former Underground Storage Tanks

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TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY	1
2.0 SITE DESCRIPTION	4
3.0 OWNERSHIP HISTORY	4
4.0 TANK LOCATIONS	5
4.1 Geophysical Survey	5
5.0 STORM DRAINAGE/INFILTRATION	5
6.0 SITE INVESTIGATIONS	7
6.1 Subsurface conditions	7
6.2 Groundwater Investigation	8
6.3 Soil Investigation	10
6.4 Costs of the Investigation	10
7.0 CONCLUSIONS	11
7.1 Groundwater Results	11
7.2 Soil Results	12
8.0 ADJACENT SITES	13

TABLES

1	Manhole and Catch Basin Infiltration Samples
2	Observations from Soil Borings
3	Groundwater Petroleum Hydrocarbons, BTEX, and Lead
4	Groundwater Volatile Organic Constituents
5	Groundwater Semivolatile Organic Constituents
6	Soil Petroleum Hydrocarbons, BTEX, and Lead
7	Soil Volatile Organic Constituents
8	Soil Semivolatile Organic Constituents

FIGURES

1	Pugnetti Park/Former Union Station Overview
2	Pugnetti Park Investigation Schematic
3	Storm and Sewer Drain Configuration

APPENDICES

A.	Historical Photos, Building Plans, and Land Records
B.	Geophysical Survey
C.	Storm Drainage/Manhole Photos and Diagrams

- D. Pugnetti Park Upstream and Downstream Storm Drain Survey
- E. Initial Investigation Report
- F. Site Survey Map
- G. Laboratory Results Sheets and Boring Logs, April and June 2003
- H. Project Costs
- I. File Review/History

1.0 EXECUTIVE SUMMARY

Pugnetti Park is located at 1955 Pacific Avenue. It is on the northeast corner of 21st Street and Pacific Avenue in Tacoma, just to the south of the Washington State History Museum. It is owned by the Washington State Department of Transportation (WSDOT), who acquired it in conjunction with construction of I-705. It is managed for park use by the City of Tacoma.

Tacoma Public Library records show that the Arlington Hotel was constructed on this site in 1889. The hotel was demolished in 1930 to make way for the Goodrich Silvertown Building, which was constructed in 1931. The Goodrich building remained on the site, under different owners (see Section 3 - Ownership History), until the land was purchased by DOT in 1980 or 1981.

The Goodrich Silvertown store had a gas station, tire sales, brake shop, rubber vulcanizing area, grease pit, and also sold household appliances. From old photos and a review of the Tacoma Polk Directory, it appears that later owners of the building also sold tires, with at least one of the tire stores also offering gasoline. At some point close to 1980, the building was demolished. Pugnetti Park was constructed in the mid-1980's during construction of I-705.

File records indicate there were three 550 gallon, and one 5000 gallon, underground gasoline storage tanks at the site. None of the file records indicate diesel was stored or sold at the site. Apparently, the fuel tanks were removed when the building was demolished and the park was constructed, as they no longer appear to be on the site. No records of the removal of the tanks have been found. A geophysical survey contracted by Ecology in 2001 confirmed the tanks are no longer present. (See Section 4 - Tank Locations).

In 1999, as part of the stormwater source control efforts for Thea Foss Waterway, City of Tacoma staff identified a small hole in the corrugated metal pipe exiting the storm sewer manhole located at the southern edge of Pugnetti Park (City manhole # 6467450, former ID #447). The hole allowed groundwater contaminated with gasoline to enter the storm drain that discharges to Thea Foss Waterway. Gasoline and benzene were detected in this water on three sampling occasions. Attempts to enlist WSDOT to repair the hole were unsuccessful, so Tacoma contracted to have the hole fixed in May, 2002. The repair appears to have been successful, to date.

On several occasions an odor has been noted emanating from manholes and catch basins around Pugnetti Park and behind the Washington State History Museum. The same odor was smelled in catch basins along I-705, just east of the history museum, and in manhole #609, located underneath the 21st street bridge. This is not a gasoline/benzene odor, but instead has been characterized as creosote-like or heavily weathered diesel or oil.

An initial investigation was completed for the site in August 2000, where the Tacoma-Pierce County Health Department (TPCHD) installed four push-probe type monitoring wells. A fifth well was installed in October as a demonstration exhibit for the 2000 Hydrogeologic Symposium. The Initial Investigation (and later sampling of the demonstration well) concluded that gas and diesel were present in soils and groundwater. The Site was ranked as "2" by the TPCHD in August of 2001. The initial investigation report is in **Appendix E** and analytical results from the initial investigation are included in **Tables 3 and 6**.

After consistently getting no cooperation from WSDOT for further investigations, Ecology decided to utilize funds from the Washington State Toxics Control Account to conduct a site characterization effort. In April and June of 2003 Ecology contracted with Environmental Services Network Northwest (ESN) to sample existing wells, install one additional monitoring well, install 9 soil borings, and sample one downgradient well near the Thea Foss Waterway.

The 2003 investigation confirmed the presence of gasoline in site soils and groundwater. The highest concentration of gasoline in soils was 2800 parts per million (ppm). The highest level of benzene detected in soils was 21 ppm. The MTCA, Method A, unrestricted use, cleanup levels for gasoline and benzene in soils are 30 ppm and 0.3 ppm, respectively. The highest concentration of gasoline in water from a monitoring well in the 2003 investigation was 35,000 parts per billion (ppb), compared to the MTCA Method A groundwater cleanup level of 800 ppb. Benzene was also present in groundwater, at 150 ppb, compared to the MTCA Method A groundwater cleanup level of 5 ppb. (See Section 6 - Site Investigations and **Table 3 and 6**).

An attempt was made to determine if the gasoline was coming from an upgradient source, by installing a boring across Pacific Avenue from the park. The boring was never installed because there were too many utilities in the street and sidewalk. However, two of the site wells from the TPCHD Initial Investigation were located very slightly upgradient from the presumed historic tank locations, and did not contain any petroleum hydrocarbons in groundwater during the Ecology investigation. (One of these wells did contain gasoline in groundwater during the 2000 Initial Investigation, but no gasoline constituents were detected in soils from the boring for that well).

One well was tested at the Albers Mill property as part of the 2003 investigation, to evaluate possible downgradient groundwater impacts from the site. The well was located near the Thea Foss Waterway, approximately ¼ mile northeast of the site in a downgradient direction. It did not contain petroleum constituents.

Ecology also tested dry weather flows in a number of manholes in the vicinity of Pugnetti Park to determine if there was evidence of gasoline infiltrating into other storm drains in the area, either from an upgradient source or from additional inflow from the Pugnetti Site. The dry weather flows in the upgradient manholes did not contain evidence of petroleum. The dry weather flow at manhole 446 did contain ethylbenzene and xylene. Manhole 446 is located within 200 feet of, and directly downgradient from the former

tank locations, in the driveway to the Washington State History Museum parking lot. Water from downstream manhole 609, close to outfall 235 into the Thea Foss Waterway, did not contain gasoline but did contain some benzene. Results of this drain investigation are found in **Appendix D**).

The cost of the investigation, not including the upstream and downstream storm drain survey described above, was \$12,335 including lab analysis, site survey, and traffic control services. (**Appendix H**).

A final point of interest for this site is the fact that one 10,000 gallon gasoline tank, one 10,000 gallon diesel tank, and one 4,000 oil tank were removed from what is now the south parking lot of the History Museum, adjacent to Pugnetti Park on the north. The tanks were associated with the maintenance yard for the Northern Pacific (later Burlington Northern Railroad maintenance yard). Although some excavation did occur, this site was never fully remediated. Monitoring wells from this site no longer exist, but results from them indicated that an upgradient source of gasoline was present (i.e., Pugnetti Park), because a monitoring well upgradient from the removed tanks contained higher levels of gasoline constituents than did the wells downgradient from the removed tanks (see Section 8 - Adjacent Sites).

Gasoline was detected infiltrating into a catch basin behind the history museum in 1999. The infiltration spot was later fixed by the History Museum, but the gasoline present in the infiltrate indicates that contamination is still present in this vicinity. It is not known whether the contaminants are from the Pugnetti Park site, the History Museum site, or both sites.

2.0 SITE DESCRIPTION

The site is located at the northeast corner of 21st Street and Pacific Avenue in Tacoma. This area generally slopes eastward toward the Thea Foss Waterway. Old photographs and plans from the Goodrich/Silverton building show that the front (west side) of the building was at the level of Pacific Avenue, while the land sloped to the east so the back of the building was at a lower level. There was a partial daylight basement under the south side of the building. The Goodrich building sat on the approximate western half of the current park site. The eastern half of the current site (downhill, behind the Goodrich building) was part of the Northern Pacific Railroad yard. (See **Figure 2** and **Appendix A**).

During the construction of I-705, the park site was filled in and the land now slopes slightly upward from west to east (where it once sloped downward toward the east). Also, the adjacent driveway to the north of the site for accessing the History Museum parking lot is approximately 10-12 feet below the surface of the adjacent park. The exit ramp from southbound I-705 to 21st Street bounds the site on the east, where there is a high retaining wall between the park and lower elevation of the highway.

The maintenance and fueling yard for the Northern Pacific Railroad was directly north of the site, in what is now the History Museum parking lot. That yard contained three underground storage tanks (one 10,000 gallon diesel, one 10,000 gallon gas, and one 4000 gallon waste oil tank). These were removed during construction of the Washington State History Museum in 1992. (See discussion under Section 8 - Adjacent Sites, and **Figures 1 and 2**).

3.0 OWNERSHIP HISTORY

The site was occupied by the Goodrich Silvertown store from the early 1930's to May of 1950. The store included gas station, tire sales, brake shop, rubber vulcanizing area, grease pit, and also sold household appliances. An historic photo from the Tacoma Public Library shows that the store sold Texaco gasoline (**Appendix A**).

A summary of a review of the Tacoma Polk Directory, showing businesses located at this address after 1950, follows:

- 1951 - Lloyd Suiter Tire Company/US Rubber (Wes Maitland and Ted Fix owners)
- 1955 - Wested Tire Inc., included gas station (Wes Maitland)
- 1962 - Phillips Explosives, Wested Tire, US Rubber (Wes Maitland)
- 1971 - Wested Tire/US Rubber (Wes Maitland/Jerry Foss)
- 1982 - Sams Tire Service
- 1983 - No longer listed

Title records obtained from WSDOT show that Earl and Irene Maitland purchased ½ interest in the property from the estate of Margaret Duevel and ½ interest in the property from Kate Richter in 1978 (Duevel and Richter each owned ½ interest in the property).

In 19890, WSDOT purchased the property from the Maitlands and currently owns the property. The City of Tacoma has an agreement with WSDOT for the City to maintain the property as a park. The City of Tacoma has stated that WSDOT installed and owns the corrugated storm drain line that exits from the manhole at the park, where inflow containing gasoline was identified by the City staff in 1999 (since fixed). Corrugated metal does not meet the City's specifications for storm drain pipes, and the City's belief is that the system was never "accepted" from WSDOT after completion of the highway. WSDOT believes the City owns the pipes.

4.0 TANK LOCATIONS

Building plans and historic records from the Goodrich Silverton building present conflicting information about the location of the tanks. The original architect plans from November, 1930 show two 550 gallon gas tanks near the pump island and one 5000 gallon gas tank north of the pump island, all located just inside the property line. The TPCHD initial investigation maps show those tank locations, and the upgradient wells for the initial investigation were installed next to where they were thought to be.

In 2002, TPCHD received funding from Ecology to conduct a historic survey of underground tanks in downtown Tacoma. An as-built blueprint discovered during that survey, dated February 20, 1931, shows the tanks were actually installed to the south of the pump island, inside the property line. There were two, 5000 gallon tanks and two, 550 gallon tanks, all for gasoline. A second sketch, dated March 1, 1933, shows three additional 550 gallon tanks were added directly west of the pump island, outside of the property line under the sidewalk. The 1931 blueprint includes a notation north of the pump island that says "space for future gasoline storage", but it appears that no tanks were ever added there.

Figure 2 shows the planned and actual location of the tanks in relationship to the current park configuration. Historic building plans and tank blueprints are included in **Appendix A**.

4.1 Geophysical Survey

Ecology contracted with GeoPotential to conduct a magnetometer survey and a ground penetrating radar (GPR) survey in June, 2001. The site was surveyed on a grid of 5 feet squares. No underground storage tanks were detected. The GPR survey detected possible underground storage tank pits, which showed up as disturbed soil zones. The locations of those zones approximately corresponded with the locations of the former tanks described above. The magnetometer survey did not detect any underground storage tanks. (**Appendix B**).

5.0 STORM DRAINAGE/INFILTRATION

The former storm and sanitary sewer lines at the 21st Street and Pacific Avenue intersection were abandoned and new lines constructed during construction of I-509. A

diagram of the current storm drain configuration is shown in **Figure 3**. It is not known if the abandoned pipes were removed when abandoned.

The gasoline problem at Pugnetti Park was brought to Ecology's attention when City of Tacoma stormwater source control crew found gasoline infiltrating into a small hole in the corrugated metal pipe exiting from the manhole at the southern edge of Pugnetti Park along 21st Street (City manhole # 6467450, former ID #447). The hole was in the pipe that discharges from MH #447 eastward toward Thea Foss Waterway, quite close to the manhole junction. Two torn areas were also noted in the pipe, slightly further from the junction. The pipe is approximately 27 feet below ground surface (ground water on this site has been measured to be present at about 15 feet below ground surface). The torn areas appeared to have been fixed from the outside, and no infiltration was noted at the tears. **Appendix C** includes diagrams and photos of the manhole.

Gasoline constituents were detected in the water flowing into the hole on three sampling occasions. Results of the infiltrate samples are in **Table 1**. Attempts to enlist WSDOT to repair the hole were unsuccessful, so Tacoma contracted with Gelco Services to have the hole fixed in May, 2002. The hole was repaired by grouting around the manhole and the first part of the corrugated metal pipe. The repair involved drilling 12 half inch holes around the corrugated metal pipe and pumping in a sealant. Gelco contractor noted that there appeared to be a void behind the area and quite a bit of sealant was needed to fill the hole.

The City of Tacoma and WSDOT dispute ownership of the pipe with the hole in it. The pipe is a 30" corrugated metal pipe. Corrugated metal does not meet the City's specifications for storm drain pipes, and the City's belief is that the system was never "accepted" from WSDOT after completion of the highway. WSDOT believes the City owns the pipes.

Gasoline was also discovered seeping into a catch basin directly behind the back doors of the History Museum, on a separate storm drain system from the one with the hole in it. The History Museum arranged to have this catch basin repaired with grout. (This infiltrate may be from the tanks that were removed from the Northern Pacific/Burlington Northern Rail Yard site during construction of the Museum.)

To determine if there was damage or inflow in the storm drain line that crosses Pugnetti park from north to south (between MH 446 and MH 447), City of Tacoma conducted a video inspection of that line in 2002, and found it to be sound. This pipe enters manhole 447 near its bottom, at about 30 feet below ground surface.

In June of 2003, Ecology and the City of Tacoma source control team investigated storm drain dry weather flows in a number of manholes in the vicinity of Pugnetti Park. Dry weather flows were sampled to determine if there was evidence of gasoline infiltrating into other storm drains in the area, either from an upgradient source or from the Pugnetti Site. The dry weather flows in the upgradient manholes did not contain evidence of petroleum. The dry weather flow at manhole 446 did contain ethylbenzene and xylene.

Manhole 446 is located directly downgradient of the former tank locations. Water from downstream manhole 609, close to outfall 235 into the Thea Foss Waterway, did not contain gasoline but did contain some benzene. Manhole 609 is the next downstream manhole from Pugnetti Park, about ¼ mile to the east. Results of this drain investigation are found in **Appendix D**).

On several occasions an odor has been noted emanating from manholes and catch basins around Pugnetti Park and behind the Washington State History Museum. The same odor was smelled in catch basins along I-705, just east of the history museum, and in manhole #609, located underneath the 21st street bridge. This is not a gasoline/benzene odor, but instead has been characterized as creosote-like, or heavily weathered diesel or oil.

6.0 SITE INVESTIGATIONS

An initial investigation was completed for the site in August 2000, when the Tacoma-Pierce County Health Department installed four push-probe type monitoring wells. SP-1, 2, 3 and 4. A fifth well (SP-5) was installed in October as a demonstration exhibit of "micro well" technology for the 2000 Hydrogeologic Symposium. The initial investigation report is in **Appendix E**.

In 2002, Ecology decided to use Clean Sites Initiative funds to further the characterization of the site. A sixth well (SP-6) and nine soil borings were installed in April 2003. Water samples were obtained from wells SP3, 4 and 6; soils were sampled from all borings; and a water sample was obtained from one boring. Wells 1 and 2 could not be sampled at that time because construction work for Link Transit had removed the part of the sidewalk at Pugnetti Park where the wells were installed, with the result that the wells were in the street and could not be accessed without a traffic diversion.

Ecology returned to the site in June 2003 to attempt to install an upgradient boring, to sample SP-1 and 2 in the street, and to obtain a sample from a downgradient well near the Thea Foss Waterway. It was not possible to install the upgradient boring because there were too many utilities in the street and sidewalk.

6.1 Subsurface conditions

The site was originally sloped down toward the east, but was later filled to slope slightly upward toward the east, so it is expected that much of the site soils are not native to this location. Also, the Goodrich-Silverton building had a basement along the south side. Two of the borings from the Ecology investigation encountered concrete, bricks, or wood, so it is evident that some of basement cavity was filled with rubble or debris.

The one boring log available from the initial investigation showed the top 8 feet consisted of silts with clay and gravel, underlain by clay to 17 feet, then coarse sand (it is not clear which boring this is from). Field observations of the April 2003 soil borings included silty clays with generally sandier materials (but still mixed with fines) at greater depths (12+ feet). **Table 2** shows observations from borings.

Likely due to the fine grained materials, wells on this site have often exhibited low productivity, and it has sometimes been difficult to obtain enough water from the wells for water samples.

Groundwater flow direction evaluations completed for remedial activities at the nearby University of Washington Tacoma campus and Washington Department of Transportation Dedente sites indicate regional groundwater flow direction in the vicinity of Pugnetti Park is to the east-northeast.

The only water level elevations obtained were measured in SP-3, 4 and 5 by Ecology in December, 2002. SP-3 was found to be dry to the bottom of the well at 20'. SP-4 water level was 16'-11.5" below top of monument (note that SP-4 top of monument is approximately 10 feet lower elevation than the other wells because of its location in the History Museum driveway). This well was reported to have a strong 'creosote-like' odor during construction. This odor has also been characterized as 'weathered diesel or oil'. SP5 water level was 22.4 feet below top of monument, with a slight gasoline odor.

6.2 Groundwater Investigation

The location of the monitoring wells is shown schematically on Figure 2. A survey of the site is included in **Appendix F**.

- SP-1 and SP-2 were installed in 2000 for the Initial Investigation. They in the sidewalk along 21st Street, just upgradient (to the west) of the location of the former tanks. Initially, it was believed that the tanks were located as shown on the 1931 architect drawings, and SP-2 was intended to be next to the larger tank. It was later discovered that the actual tank locations were different from the architect plans (therefore, the tank locations shown in the Initial Investigation Report are not correct). Nevertheless, SP-1 and SP-2 were located close to and upgradient from the former tank locations. The sidewalk on Pacific Avenue was later pulled back from the street by a few feet during construction of the Link transit line, and the wells are now located in the street.
- SP-3 was installed in 2000 for the Initial Investigation. It is located to the northwest of the park, in the sidewalk at the west edge of the History Museum Parking lot. This was just to the west of the former Northern Pacific/Burlington Northern Railroad garage.
- SP-4 was installed for the 2000 Initial Investigation. It is located at the north side of the park, in the driveway that goes to the back of the History Museum parking lot. This is a downgradient direction from the Pugnetti tanks, and is also close to the south edge of the excavation that was completed for the Northern Pacific tanks.
- SP-5 is a "micro" well installed just to the east of SP-2, as a demonstration for the Washington Hydrogeologic Symposium (1/2 inch diameter) in 2000. It was located in what was thought to be immediately downgradient of the larger tank

(which later turned out to have been installed farther south than originally thought).

- SP-6 was installed during the 2003 Ecology Clean Sites investigation to determine whether gasoline contamination is also present in groundwater further downgradient than SP-4.
- The top of monument at SP-4 and SP-6 are about 10' – 12' lower than the rest of the wells, in the sloping driveway for the History Museum parking lot.
- One well was tested at the Albers Mill property in the 2003 investigation. MW S7A is located approximately ¼ mile northeast of the site, in a downgradient direction.

As part of its investigation, Ecology planned to install a boring across Pacific Avenue from the site to determine if there were upgradient sources of gasoline. This was because monitoring well SP1 and SP2 contained gasoline contaminants during the initial investigation, yet were supposed to be upgradient of the tanks. This effort was not completed because there were too many utilities in the street and sidewalk to safely install a soil boring.

Water samples taken for the Clean Sites Initiative project included the following:

SP-1	NWTPH-Dx; NWTPH-Gx; HCID
SP-2	NWTPH-Dx; NWTPH-Gx; HCID
SP-3	NWTPH-Dx; NWTPH-Gx; BTEX (method 8021B)
SP-4	NWTPH-Dx; NWTPH-Gx; BTEX (8021B); VOA (8260); SVOC (8270); total lead; dissolved lead (6020).
SP-4D	(Duplicate for SP-4): same as SP-4
SP-6	NWTPH-Dx; NWTPH-Gx; BTEX; total lead; dissolved lead
B1 (Push probe grab groundwater sample):	NWTPH-Dx; NWTPH-Gx; BTEX; VOA, SVOC; total lead; dissolved lead

6.3 Soil Investigation

Soil samples were obtained from the four monitoring well borings installed by TPCHD for the Initial Investigation in 2000. In 2003 Ecology installed nine soil borings in addition to one monitoring well, as shown on **Figure 2**. Boring depths and observations are shown in **Table 2**. Most borings met refusal around 24 feet. Gasoline odors were noted in all borings, usually at depths below 16 feet.

At least one soil sample was obtained from all site borings from the 2003 investigation, except B9. Samples were screened with a photoionization detector (PID), and sample intervals were chosen based on high PID readings and odor. Gasoline odors were detected in all soil borings. All soil samples were analyzed for gasoline (NWTPH-Gx), diesel/oil (NWTPH-Dx), and BTEX (8021B). Soil samples from B-1 at 16 feet, and B-2.1 at 12 feet were also analyzed for volatile and semivolatile organic constituents (methods 8260 and 8270) and lead (method 7000).

6.4 Costs of the Investigation

The cost of the investigation, not including Ecology lab costs for the drain survey described in Section 5, was \$12,335 including lab analysis, site survey, and traffic control services. (**Appendix H**).

Traffic Control Services: (1/2 day, plus mobilization & equipment) \$257

ESN Northwest 4/24/03: \$7,023

Separate invoice for overtime: \$300

Field work and equipment 2 days, 1 monitoring well: \$4,043

Lab Analysis: \$3,280

15 soil samples for NWTOP-DX, Gx, BTEX

15 water samples for NWTOP-DX, Gx, BTEX

4 soil by 8260

4 water by 8260

4 soil by 8270

4 water by 8270

5 total lead water

5 lead soil

3 dissolved lead water

ESN Northwest 6/6/03: \$1615

Direct push services, partial day (for well sampling), street bond, permit: \$1105

Three water samples, HCID, Dx, gasoline: \$510

AHBL engineers (Topo Survey): \$3,140

7.0 RESULTS

Data quality was reviewed by Ecology staff. All results for quality control samples were within acceptable limits. Laboratory results sheets, chain of custody forms, and boring logs from the 2003 investigation are found in **Appendix G**. Sample results confirm that the site groundwater and soils are contaminated with gasoline and its constituents.

7.1 Groundwater Results

Results of all water samples at Pugnetti Park, including the Clean Sites Investigation, TPCHD Initial Investigation, and SP-5 samples by City and TPCHD are shown in Table 3 (TPH, BTEX, lead), Table 4 (VOC), and Table 5 (SVOC).

Gasoline has been detected in all site monitoring wells except SP-1. SP-2 contained 3,500 ppb of gasoline in June of 2000 for the initial investigation, but gasoline was not detected in that well in June of 2003. SP-1 and 2 are located slightly upgradient of the former tank locations.

Downgradient wells SP-4 and SP-6 contained the highest detections of gasoline in the 2003 well samples, with 22,000 and 35,000 ppb, respectively. SP-6, with the highest level of gasoline, is the farthest downgradient well in the immediate site vicinity. The water sample from boring B-1 (close to the former tank locations) contained quite high gasoline, at 46,000 ppb. High turbidity in this sample likely affected the result. The MTCA, Method A cleanup level for gasoline in groundwater is 800 ppb, where benzene is also present.

Benzene was present in two of the three wells where benzene was analyzed for in 2003 (SP 3, 4, and 6). It was not present in SP-3, and was present at 150 and 140 ppb at SP-4 and SP-6, respectively. The MTCA, Method A cleanup level for benzene in groundwater is 5 ppb. Ethylbenzene and xylenes were also present above their respective groundwater cleanup levels, as shown on Table 3 and 4.

Diesel was detected in two wells in 2000-2001 (SP 4 contained 37,000 ppb and SP 5 contained 4,010 ppb). It is possible the diesel in SP 4 could be related to remaining diesel from the underground tanks at the Northern Pacific/Burlington Northern Railroad maintenance yard that were removed during construction of the History Museum Parking lot, or that there were unreported diesel tanks at the former Goodrich-Silvertown facility. However, diesel was not detected in any of the 2003 water samples. Also, no significant levels of diesel were present in any soil samples taken at the site.

Total lead in groundwater was detected at 16.4 ppb in SP-1, slightly above the MTCA, Method A groundwater cleanup level of 15 ppb. Dissolved lead in that same sample was detected at 10.7 ppb. Arsenic was analyzed for in the Initial Investigation samples in 2000, and was detected above the MTCA, Method A cleanup standard of 5 ppb at SP-1 (11 ppb) and SP-4 (27 ppb). There is no evidence that source of arsenic is from Pugnetti Park.

Two water samples were analyzed for volatile and semi-volatile organic chemicals (SP-4 and B1). The only analytes detected in the VOC and SVOC analysis were associated with gasoline or weathered gasoline: benzene, toluene, ethylbenzene, xylenes, n-propylbenzene, 1,3,5-trimethylbenzene, 1,2,4 trimethylbenzene, sec-butylbenzene, isopropyltoluene, and naphthalene.

It does not appear that the gasoline is coming from an upgradient source, based on the fact that gasoline was not detected in either SP-1 or SP-2 in the June, 2003 sample event. When SP-2 was sampled in June of 2000, there was a detection of gasoline at 3,500 ppb (compared to the MTCA, method A groundwater cleanup level of 800 ppb). This may be due to the fact that the well is located close to the former tank locations, and a water main corridor runs through that area, possibly resulting in some detection of gasoline in what would be upgradient from the former tank. In the June 2003 sample event, gasoline was not detected in either upgradient well.

The gasoline plume extends at least to the downgradient well, SP6, with 35,000 ppb gasoline detected in 2003. It is not known how much, if any, of the contamination in the downgradient well may be comingled with remaining gasoline contamination from the Northern Pacific/Burlington Northern Railroad tanks. However, it is clear that the gasoline contamination from the former Goodrich-Silvertown tanks is moving toward the northeast. The I-705 southbound exit ramp onto 21st Street, and presence of a high retaining wall along the east edge of Pugnetti Park may have an effect on groundwater flow directions and the movement of the plume.

One well was tested at the Albers Mill property, located approximately ¼ mile northeast of the site, in a downgradient direction, east of I-705, the railroad tracks, and Dock Street. This well did not contain petroleum constituents.

7.2 Soil Results

Soil sample results are shown in Table 6 (TPH, BTEX, lead), Table 7 (VOC), and Table 8 (SVOC).

Gasoline was detected in ten of fifteen soil samples. It was undetected in the soil borings for the upgradient wells (SP1 and SP2), and detected at only 18 ppb at the cross-gradient well along Pacific Avenue in the sidewalk for the History Museum (SP-13). The highest detections were in the boring for well SP4 (1700 ppm); boring B4 (2800 ppm), boring B2.1 (1900 ppm), and boring B8 (490 ppm). The remaining detections of gasoline ranged from 140-180 ppm. The MTCA, Method A, unrestricted use, soil cleanup level for gasoline (with benzene present) is 30 ppm. Benzene was present in ten of fifteen soil samples, with detected amounts ranging from 0.06 to 21 ppb. The MTCA, Method A, unrestricted use, soil cleanup level for benzene is 0.03 ppm. Other gasoline constituents were present above the MTCA, Method A soil cleanup level as well, as shown in Tables 6 and 7.

Diesel was detected in six soil samples, ranging from 80-490 ppm, all below the MTCA, Method A soil cleanup level for diesel of 2000 ppm. The only detection of lead was 11

ppm, well below the soil cleanup standard of 250 ppm. The only analytes detected in the VOC and SVOC analysis were associated with gasoline or weathered gasoline: ethylbenzene, xylenes, isopropylbenzene, n-propylbenzene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, sec-butylbenzene, isopropyltoluene, and naphthalene.

8.0 ADJACENT SITES

Washington State History Museum (formerly Northern Pacific/Burlington Northern railroad maintenance yard). (The information about this site is from a review of Ecology's Southwest Regional Office Files for the Washington State History Museum Site, and also from the City of Tacoma Round 3 Data Evaluation Report for Thea Foss Waterway, Appendix Q, Chapter 5.)

Three USTS were removed in 1992 during construction for the History Museum. The tanks were from a maintenance facility for the former Northern Pacific/Burlington Northern Railroad site.

- 1 – 10,000 gallon gasoline
- 1 – 10,000 gallon diesel
- 1 – 4,000 waste oil

Contamination was present surrounding and below the tanks. Soils were excavated to the groundwater level (greater than 10' below ground surface). Of the 5,142 cubic yards of soil excavated, 3,233 yards were contaminated. Over two thousand yards were treated with an on-site thermal desorption unit. The remaining contaminated soil was returned to the excavation, followed by the uncontaminated and the treated soils. (TPCHD approved the return of contaminated soils to the excavation). Well SP-4 from the Pugnetti Park investigation is near the south edge of the excavated area

Ten monitoring wells were installed. Groundwater contamination was present throughout the south end of the property and continued north along the east side of the property. Some of the worst contamination was at MW9, upgradient from the tank locations, toward Pugnetti Park. In 1995, after construction of the parking lot was complete, the upgradient well (MW-9) and the farthest downgradient well (MW-7) were sampled. Levels of BTEX and gasoline had dropped below detection limits in MW-7, but MW9 contained 1300 ppb of gasoline.

Wells from the Bison Investigation are no longer present. All wells except for MW 8 were either destroyed during construction of the parking lot, lost, or abandoned. Given the history of construction in this area, MW 8 is the only well that is likely to still remain, but it has never been found. It is probably buried beneath landscaping at the northwest edge of the Pugnetti Park.

The TPCHD initial investigation report for Pugnetti Park (TPCHD, August 1, 2000) states that "the soil and groundwater contamination sources originating from the museum property was determined to be fully remediated after review by the TPCHD." However,

the initial investigation report also indicates that excavation to the west was stopped at the edge of the Pacific Avenue sidewalk, but that contaminants continued under the sidewalk to the west.

TPCHD recommended ongoing sampling of the monitoring wells located at the south end of the museum property, and recommended that a passive vapor extraction system be installed beneath the south end of the museum facility. The vapor extraction system was recommended to deal with the possible build up of vapors due to migration of petroleum contaminants from the unknown off site source.” (The vapor extraction system was never installed). The Washington State Historical Society determined they would not pursue further remediation at the History Museum site until/unless the upgradient source would be addressed.

WSDOT Dedente Site

The DeDente site is located across 21st Street, south of Pugnetti Park at the southeast corner of 21st Street and Pacific Avenue. This site now contains a parking area and a stormwater detention facility. The Dedente site at one time operated as a service station, bus maintenance facility, and machine shop. The site contained underground gasoline, diesel, and heating oil tanks. During construction of I-509, WSDOT removed the tanks and conducted a large amount of excavation. Gasoline and benzene were not detected in confirmation groundwater sampling results from 2002 at the DeDente site.

West Coast Steel

There was a heating oil tank at 1954 Pacific Avenue, directly across Pacific Avenue from Pugnetti Park (discovered in the 2003 survey of historic underground tanks in downtown Tacoma conducted by the Tacoma-Pierce County Health Department). The tank was on the south side of the building under what would now be the sidewalk of 21st Street near the corner of Pacific. The record of this tank is from 1926. No further information is available about the heating oil tank.

Table 1: Pugnetti Park Vicinity: Manhole and Catch Basin Infiltration Samples, City of Tacoma

	Diesel mg/l	Oil mg/l	Gas ug/l	Benzene ug/l
Museum CB infiltrate (7/99)	0.25 U	0.50 U	600	29
MH 447 infiltrate (7/99)	0.25 U	0.50 U	700	240
MH 447 infiltrate (5/9/01)	Not tested	Not tested	3,140	296
MH 447 infiltrate (12/01)	Not tested	Not tested	920	230

Table 2: Pugnetti Park – Observations from Soil Borings

Boring	Depth (feet)	PID Reading	Soil Observations	Odor	Sample	Comments
SP6	6-8	50		Slight		
	8-12	82		Slight		
	12-16	4000		Strong	Dx, Gx, BTEX	Sample SP6-12
	16-18	800		Slight		Refusal at 18'
B1	4-8		Light brown sand/dark brown silt	No		
	10-12	740	Light brown clay/silt	No		
	12-16	450	Gray sand	Slight		
	16-18	10,000+	Gray sand with silt	Strong	Dx, Gx, BTEX, lead, VOA, SVOC	B1-16
	18-20	3100	Gray clay/silt, wet	Strong		
	20-22	4500	Light brown clay/silt	Medium		
	22-24	3400	Light brown clay/silt	Medium	Water, Dx, Gx, BTEX, total and dissolved lead, VOA, SVOC	B1-W Refusal at 24' grab water sample at 24'
B2	0-12					Brick, concrete, stained wood. Possible void – difficult to fill boring
B2.1	0-4			No		
	4-8			No		
	8-12	450	Gray sand with wood	Slight		
	12-14	10,000	Gray sand with bricks	Strong	Dx, Gx, BTEX, lead, VOA, SVOC	B2.1-12
	14-16	4700		Strong		
	16-18	4400	Gray sand with silt	Strong		

Table 2, Continued

	18-20	5200	Gray sand with silt	Strong		
	20-22	1600	Gray sand with silt	Slight		
	22-24	490	Gray silt	Slight		Refusal at 24'
B3	4-8			No		
	8-12			Very slight		
	12-16		Dark gray with crumbled brick layer.	Medium		Gasoline odor in brick
	16-20	4700	Gray sand with silt	Medium		
	20-24	10,000+	Gray sand with silt, then light brown, sandy	Strong	Dx, Gx, BTEX	B3-20
B4	0-4			No		
	6-8	25		Slight		
	8-10	25		No		
	10-12	82		Slight		
	12-14	207	Light brown with gray sand, damp	Slight		
	14-16	185	Same	Slight		
	16-20	3450	Same	Medium	Dx, Gx, BTEX	B4-16
	20-24	2002	Light gray crumbly grading to silty and wet	Medium		
	24-27	125	Wet, rocky			
B5	0-4		Light brown sand with clay	Slight		
	4-8	28	Gray then brown sand, bottom 1' stained and wet	Medium		
	8-10	5	Gray stiff clay	None		
	10-12	15	Same	None		
	12-16	3500	Gray sandy clay	None	Dx, Gx, BTEX	B5-12 Duplicate taken
	16-18	130	Light brown sandy, dry rocky			
	18-20	220	Dark section with odor	Medium		
	20-24	3000	Gray sandy clay with rocks	Medium		Refused at 24'
B6	0-4			None		
	4-8		Brown sandy	None		
	8-12		Brown sandy	None		
	12-16		Gray sandy clay	None		
	16-18	760	Gray sandy clay	Slight		

Table 2, continued

	18-20	4000	Gray sandy clay	Slight	Dx, Gx, BTEX	B6-18
	20-23	35	Poor recovery			Refused at 23'
B7	0-4			None		
	4-8		Brown gray sand grades to clay	None		
	8-12		Brown clay	None		
B7.1	12-14	340	Gray clay	Slight		Top 6" black 'tarry'
	14-16	500	Gray clay grades to brown clay	Slight		
	16-18	10,000+	Gray sandy clay	Slight		
	18-20	2000	Same	Slight		
	20-24	10,000	Gray clay, wet	Slight	Dx, Gx, BTEX	B7.1-20 Duplicate taken Refused at 25'
B8	0-4			None		
	4-8			None		
	8-12		Sandy then clay	Slight		
	12-14		White sand then dark gray clay	Slight		
	14-16	500	Darky sandy clay	Medium		
	16-20					Poor recovery
	20-24	745	Dark gray sand, damp	Medium		
	24-26	745	Gray sand, damp	Medium		
	26-28		Reddish brown sand	Strong	Dx, Gx, BTEX	B8-26
	28-31		Gray sandy clay	Medium		Refused at 31'
B9	0-4		Light brown clay	None		
	4-8		Light brown clay	None		
	8-12		Grades to sandier clay	None		
	12-14	172	Gray till	Medium		Wet at top 6"
	14-16	3.9	Grades to brown	Slight		
	16-17	1700	Dry crumbly sandy	Medium		
	17-19	1600	Wet sandy	Medium		

TABLE 3: Pugnetti Park Groundwater - Petroleum Hydrocarbons, BTEX, Lead and Arsenic*

Well	Date	Diesel ug/l	Oil ug/l	Gasoline ug/l	Benzene ug/l	Toluene ug/l	Ethylbenzene ug/l	Xylenes ug/l	Lead (total) ug/l	Lead (Dissolved) ug/l	Arsenic (Dissolved) Ug/l
SP-1	6/23/00	200 U	400 U	100 U	1 U	1 U	1 U	1 U		0.5 U	11
SP-1	6/4/03	200 U		100 U							
SP-2	6/23/00	200 U	400 U	3,500	32	89	230	24		0.5 U	3.9
SP-2	6/4/03	200 U		100 U							
SP-3**	4/2/03	200 U	400 U	100 U	1 U	1 U	1 U	1 U			
SP-4	6/23/00	37,000	400 U	46,000	420	570	1400	6,900		4.1	27
SP-4	4/2/03	200 U	400 U	22,000	150	170	460	2,500	5 U	5 U	
SP-5	12/14/00			4,200							
SP-5	12/20/01	4,010	2,600	17,000							
SP-6	4/2/03	200 U	400 U	35,000	140	100	1,300	4,200	16.4	10.7	
B-1	4/2/03	200 U	400 U	46,000	230	210	930	4,000			
MWS7A	6/4/03	200 U		100 U							
MTCA Method A		500	500	800	5	1,000	700	1,000	15		

*Initial Investigation water samples were tested for RCRA 8 metals. All other metals were not detected or detected at low levels.

**During the initial investigation (June, 2000), the push probe met refusal at 17 feet and no groundwater sample was obtained from SP-3.

Table 4

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WA DEPT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

VOC water

Result

Duplicate Result

Analytical Results

8260, µg/L	MTH BLK		LCS	4-W	4-WD
Matrix	Water	Water	Water	Water	Water
Date extracted	Reporting	04/24/03	04/24/03	04/24/03	04/24/03
Date analyzed	Limits	04/24/03	04/24/03	04/24/03	04/24/03
Dichlorodifluoromethane	1.0	nd		nd	nd
Chloromethane	1.0	nd		nd	nd
Vinyl chloride	0.2	nd		nd	nd
Bromomethane	1.0	nd		nd	nd
Chloroethane	1.0	nd		nd	nd
Trichlorofluoromethane	1.0	nd		nd	nd
1,1-Dichloroethene	1.0	nd		nd	nd
Methylene chloride	1.0	nd		nd	nd
trans-1,2-Dichloroethene	1.0	nd		nd	nd
1,1-Dichloroethane	1.0	nd		nd	nd
cis-1,2-Dichloroethene	1.0	nd		nd	nd
2,2-Dichloropropane	1.0	nd		nd	nd
Chloroform	1.0	nd		nd	nd
Bromochloromethane	1.0	nd		nd	nd
1,1,1-Trichloroethane	1.0	nd		nd	nd
1,2-Dichloroethane	1.0	nd		nd	nd
1,1-Dichloropropene	1.0	nd		nd	nd
Carbon tetrachloride	1.0	nd		nd	nd
Benzene	1.0	nd	105%	230	200
Trichloroethene	1.0	nd		nd	nd
1,2-Dichloropropane	1.0	nd		nd	nd
Dibromomethane	1.0	nd		nd	nd
Bromodichloromethane	1.0	nd		nd	nd
cis-1,3-Dichloropropene	1.0	nd		nd	nd
Toluene	1.0	nd	107%	420	330
trans-1,3-Dichloropropene	1.0	nd		nd	nd
1,1,2-Trichloroethane	1.0	nd		nd	nd
1,3-Dichloropropane	1.0	nd		nd	nd
Dibromochloromethane	1.0	nd		nd	nd
Tetrachloroethene	1.0	nd		nd	nd
1,2-Dibromoethane (EDB)(*)	0.01	nd		nd	nd
Chlorobenzene	1.0	nd		nd	nd
1,1,1,2-Tetrachloroethane	1.0	nd		nd	nd
Ethylbenzene	1.0	nd		2,200	1,800
Xylenes	1.0	nd		8,700	7,300
Styrene	1.0	nd		nd	nd
Bromoform	1.0	nd		nd	nd
1,1,2,2-Tetrachloroethane	1.0	nd		nd	nd
Isopropylbenzene	1.0	nd		68	58
1,2,3-Trichloropropane	1.0	nd		nd	nd
Bromobenzene	1.0	nd		nd	nd
n-Propylbenzene	1.0	nd		190	150
2-Chlorotoluene	1.0	nd		nd	nd
4-Chlorotoluene	1.0	nd		nd	nd
1,3,5-Trimethylbenzene	1.0	nd		520	500
tert-Butylbenzene	1.0	nd		nd	nd
1,2,4-Trimethylbenzene	1.0	nd		2,400	2,300
sec-Butylbenzene	1.0	nd		7.9	7.1
1,3-Dichlorobenzene	1.0	nd		nd	nd
1,4-Dichlorobenzene	1.0	nd		nd	nd
Isopropyltoluene	1.0	nd		5.1	5.3
1,2-Dichlorobenzene	1.0	nd		nd	nd
n-Butylbenzene	1.0	nd		nd	nd
1,2-Dibromo-3-Chloropropane	1.0	nd		nd	nd
1,2,4-Trichlorobenzene	1.0	nd		nd	nd
Naphthalene	1.0	nd		170	220
Hexachloro-1,3-butadiene	1.0	nd		nd	nd
1,2,3-Trichlorobenzene	1.0	nd		nd	nd

*Instrument detection limits

Table 4

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WA DEPT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Analytical Results

8260, µg/L		MTH BLK	LCS	4-W	4-WD
Matrix	Water	Water	Water	Water	Water
Date extracted	Reporting	04/24/03	04/24/03	04/24/03	04/24/03
Date analyzed	Limits	04/24/03	04/24/03	04/24/03	04/24/03

Surrogate recoveries

Dibromofluoromethane	125%	91%	97%	98%
Toluene-d8	76%	101%	97%	95%
4-Bromofluorobenzene	97%	94%	98%	95%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

Acceptable Recovery limits: 65% TO 135%

Acceptable RPD limit: 35%

#DIV/0!

Table 4

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WA DEPT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

VOC QC

Analytical Results

8260, µg/L	MS	MSD	RPD
Matrix	Water	Water	Water
Date extracted	Reporting	04/24/03	04/24/03
Date analyzed	Limits	04/24/03	04/24/03
Dichlorodifluoromethane	1.0		
Chloromethane	1.0		
Vinyl chloride	0.2		
Bromomethane	1.0		
Chloroethane	1.0		
Trichlorofluoromethane	1.0		
1,1-Dichloroethene	1.0		
Methylene chloride	1.0		
trans-1,2-Dichloroethene	1.0		
1,1-Dichloroethane	1.0		
cis-1,2-Dichloroethene	1.0		
2,2-Dichloropropane	1.0		
Chloroform	1.0		
Bromochloromethane	1.0		
1,1,1-Trichloroethane	1.0		
1,2-Dichloroethane	1.0		
1,1-Dichloropropene	1.0		
Carbon tetrachloride	1.0		
Benzene	1.0	105%	95% 10%
Trichloroethene	1.0		
1,2-Dichloropropane	1.0		
Dibromomethane	1.0		
Bromodichloromethane	1.0		
cis-1,3-Dichloropropene	1.0		
Toluene	1.0	101%	93% 8%
trans-1,3-Dichloropropene	1.0		
1,1,2-Trichloroethane	1.0		
1,3-Dichloropropane	1.0		
Dibromochloromethane	1.0		
Tetrachloroethene	1.0		
1,2-Dibromoethane (EDB)(*)	0.01		
Chlorobenzene	1.0		
1,1,1,2-Tetrachloroethane	1.0		
Ethylbenzene	1.0		
Xylenes	1.0		
Styrene	1.0		
Bromoform	1.0		
1,1,2,2-Tetrachloroethane	1.0		
Isopropylbenzene	1.0		
1,2,3-Trichloropropane	1.0		
Bromobenzene	1.0		
n-Propylbenzene	1.0		
2-Chlorotoluene	1.0		
4-Chlorotoluene	1.0		
1,3,5-Trimethylbenzene	1.0		
tert-Butylbenzene	1.0		
1,2,4-Trimethylbenzene	1.0		
sec-Butylbenzene	1.0		
1,3-Dichlorobenzene	1.0		
1,4-Dichlorobenzene	1.0		
Isopropyltoluene	1.0		
1,2-Dichlorobenzene	1.0		
n-Butylbenzene	1.0		
1,2-Dibromo-3-Chloropropane	1.0		
1,2,4-Trichlorobenzene	1.0		
Naphthalene	1.0		
Hexachloro-1,3-butadiene	1.0		
1,2,3-Trichlorobenzene	1.0		

*-instrument detection limits

Table 4

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WA DEPT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Analytical Results

8260, µg/L		MS	MSD	RPD
Matrix	Water	Water	Water	
Date extracted	Reporting	04/24/03	04/24/03	
Date analyzed	Limits	04/24/03	04/24/03	

Surrogate recoveries

Dibromofluoromethane	101%	101%
Toluene-d8	94%	95%
4-Bromofluorobenzene	96%	107%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

Acceptable Recovery limits: 65% TO 135%

Acceptable RPD limit: 35%

Table 5

SVOC water

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WASHINGTON DEPARTMENT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Result
Duplicate Result

Analytical Results

8270, µg/L		MTH BLK	LCS	SP4-W	SP4-4D	MS	MSD	RPD
Matrix	Water	Water	Water	Water	Water	Water	Water	
Date extracted	Reporting	04/23/03	04/24/03	04/23/03	04/23/03	04/24/03	04/24/03	
Date analyzed	Limits	04/23/03	04/24/03	04/23/03	04/23/03	04/24/03	04/24/03	
Penachloroethane	2.0	nd		nd	nd			
Bis (2-chloroethyl) ether	2.0	nd		nd	nd			
1,3-Dichlorobenzene	2.0	nd		nd	nd			
1,4-Dichlorobenzene	2.0	nd		nd	nd			
1,2-Dichlorobenzene	2.0	nd		nd	nd			
2-Methylphenol (o-cresol)	2.0	nd		nd	nd			
Bis (2-chloroisopropyl) ether	2.0	nd		nd	nd			
3,4-Methylphenol (m,p-cresol)	2.0	nd		nd	nd			
Bis (2-chloroethoxy) methane	2.0	nd		nd	nd			
1,2,4-Trichlorobenzene	2.0	nd		nd	nd			
Naphthalene	1.0	nd		94	120			
Hexachloropropylene	10	nd		nd	nd			
Hexachlorobutadiene	10	nd		nd	nd			
1,2,4,5-Tetrachlorobenzene	2.0	nd		nd	nd			
Hexachlorocyclopentadiene	2.0	nd		nd	nd			
2,4,5-Trichlorophenol	10	nd		nd	nd			
2-Chloronaphthalene	2.0	nd		nd	nd			
Dimethylphthalate	2.0	nd		nd	nd			
Acenaphthylene	1.0	nd	93%	nd	nd	96%	114%	17%
Acenaphthene	1.0	nd		nd	nd			
Pentachlorobenzene	2.0	nd		nd	nd			
Fluorene	1.0	nd		nd	nd			
Diethylphthalate	10	nd		nd	nd			
4-Chlorophenylphenylether	2.0	nd		nd	nd			
N-Nitrosodiphenylamine	2.0	nd		nd	nd			
4-Bromophenylphenylether	2.0	nd		nd	nd			
Hexachlorobenzene	2.0	nd		nd	nd			
Phenanthrene	1.0	nd		nd	nd			
Anthracene	1.0	nd		nd	nd			
Di-n-butylphthalate	2.0	nd		nd	nd			
Fluoranthene	1.0	nd		nd	nd			
Pyrene	1.0	nd	89%	nd	nd	94%	107%	13%
Butylbenzylphthalate	10	nd		nd	nd			
Benzo(a)anthracene	2.0	nd		nd	nd			
Chrysene	0.1	nd	97%	nd	nd	85%	95%	11%
Bis (2-ethylhexyl) ether	2.0	nd		nd	nd			
Di-n-octylphthalate	10	nd		nd	nd			
Benzo(b)fluoranthene	1.0	nd		nd	nd			
Benzo(k)fluoranthene	1.0	nd		nd	nd			
Benzo(a)pyrene	0.1	nd		nd	nd			
Dibenzo(a,h)anthracene	1.0	nd		nd	nd			
Benzo(ghi)perylene	1.0	nd		nd	nd			
Indeno(1,2,3-cd)pyrene	1.0	nd		nd	nd			

Table 5

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WASHINGTON DEPARTMENT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Analytical Results

8270, µg/L		MTH BLK	LCS	SP4-W	SP4-4D	MS	MSD	RPD
Matrix	Water	Water	Water	Water	Water	Water	Water	
Date extracted	Reporting	04/23/03	04/24/03	04/23/03	04/23/03	04/24/03	04/24/03	
Date analyzed	Limits	04/23/03	04/24/03	04/23/03	04/23/03	04/24/03	04/24/03	

Surrogate recoveries

2-Fluorobiphenyl	100%	96%	100%	100%	95%	93%
4-Terphenyl-d14	93%	91%	91%	91%	87%	85%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

TABLE 6: Pugnetti Park Soils - Petroleum Hydrocarbons, BTEX, Lead and Arsenic*

Boring	Date	Diesel mg/kg	Oil mg/kg	Gasoline mg/kg	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Xylenes mg/kg	Arsenic mg/kg	Lead mg/kg
SP-1-16	6/23/00	20 U	40 U	10 U	0.06	0.10	0.40	1.6	5 U	5 U
SP-2-14	6/23/00	20 U	40 U	10 U	0.05 U	0.05 U	0.05 U	0.05 U	5 U	5 U
SP-2-19	6/23/00	20 U	40 U	10 U	0.05 U	0.05 U	0.05 U	0.05 U	5 U	5 U
SP-3-17	6/23/00	490	40 U	18	0.05 U	0.06	0.3	1.8	5 U	5 U
SP-4-16	6/23/00	630	40 U	1700	21	9.8	37	190	5 U	5 U
SP-4-19	6/23/00	220	40 U	150	0.21	0.61	1.6	3.4	5 U	5 U
SP-5	No soil samples obtained									
SP-6-12	4/2/03	230	40 U	180	0.20	0.37	2.4	5.5		5 U
B-1-16	4/2/03	20 U	40 U	160	0.74	0.47	1.7	7.6		
B-2.1-12	4/2/03	20 U	40 U	1900	2.9	6.6	21	170		11
B-3-20	4/2/03	20 U	40 U	140	0.93	0.67	3.3	12		
B-4-16	4/2/03	150	40 U	2800	10	24	41	190		
B-5-12	4/2/03	20 U	40 U	10 U	0.02 U	0.05 U	0.05 U	0.05 U		
B-6-18	4/2/03	20 U	40 U	10 U	0.02 U	0.06 U	0.05 U	0.05 U		
B-7.1-20	4/2/03	83	380	150	0.85	0.20	0.52	0.05 U		
B-8-26	4/2/03	20 U	40 U	490	3.2	1.8	4.5	16		
MTCA Method A		2,000	2,000	30	0.03	7	6	9	20	250

*Initial Investigation water samples were tested for RCRA 8 metals. All other metals were not detected or detected at low levels.

Table 7

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

Soil VOA

ESN Job Number: S30423-2
 Client: WASHINGTON DEPARTMENT OF ECOLOGY
 Client Job Name: PUGNETTI PARK
 Client Job Number: JIB29

Analytical Results

8260, µg/kg		MTH BLK	LCS	B1-5-16	B2-1-12	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Date extracted	Reporting	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	
Date analyzed	Limits	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	
Dichlorodifluoromethane	50	nd		nd	nd			
Chloromethane	50	nd		nd	nd			
Vinyl chloride	50	nd		nd	nd			
Bromomethane	50	nd		nd	nd			
Chloroethane	50	nd		nd	nd			
Trichlorofluoromethane	50	nd		nd	nd			
1,1-Dichloroethene	50	nd		nd	nd			
Methylene chloride	20	nd		nd	nd			
trans-1,2-Dichloroethene	50	nd		nd	nd			
1,1-Dichloroethane	50	nd		nd	nd			
cis-1,2-Dichloroethene	50	nd		nd	nd			
2,2-Dichloropropane	50	nd		nd	nd			
Chloroform	50	nd		nd	nd			
Bromochloromethane	50	nd		nd	nd			
1,1,1-Trichloroethane	50	nd		nd	nd			
1,2-Dichloroethane	50	nd		nd	nd			
1,1-Dichloropropene	50	nd		nd	nd			
Carbon tetrachloride	50	nd		nd	nd			
Benzene	20	nd	97%	nd	nd	96%	91%	5%
Trichloroethene	20	nd		nd	nd			
1,2-Dichloropropane	50	nd		nd	nd			
Dibromomethane	50	nd		nd	nd			
Bromodichloromethane	50	nd		nd	nd			
cis-1,3-Dichloropropene	50	nd		nd	nd			
Toluene	50	nd	98%	nd	nd	96%	89%	8%
trans-1,3-Dichloropropene	50	nd		nd	nd			
1,1,2-Trichloroethane	50	nd		nd	nd			
1,3-Dichloropropane	50	nd		nd	nd			
Dibromochloromethane	50	nd		nd	nd			
Tetrachloroethene	20	nd		nd	nd			
1,2-Dibromoethane (EDB)(*)	5	nd		nd	nd			
Chlorobenzene	50	nd		nd	nd			
1,1,1,2-Tetrachloroethane	50	nd		nd	nd			
Ethylbenzene	50	nd		nd	710			
Xylenes	50	nd		200	7,100			
Styrene	50	nd		nd	nd			
Bromoform	50	nd		nd	nd			
1,1,2,2-Tetrachloroethane	50	nd		nd	nd			
Isopropylbenzene	50	nd		nd	320			
1,2,3-Trichloropropane	50	nd		nd	nd			
Bromobenzene	50	nd		nd	nd			
n-Propylbenzene	50	nd		nd	1,700			
2-Chlorotoluene	50	nd		nd	nd			
4-Chlorotoluene	50	nd		nd	nd			
1,3,5-Trimethylbenzene	50	nd		160	3,600			
tert-Butylbenzene	50	nd		nd	nd			
1,2,4-Trimethylbenzene	50	nd		660	17,000			
sec-Butylbenzene	50	nd		nd	360			
1,3-Dichlorobenzene	50	nd		nd	nd			
1,4-Dichlorobenzene	50	nd		nd	nd			
Isopropyltoluene	50	nd		nd	200			
1,2-Dichlorobenzene	50	nd		nd	nd			
n-Butylbenzene	50	nd		nd	nd			
1,2-Dibromo-3-Chloropropane	50	nd		nd	nd			
1,2,4-Trichlorobenzene	50	nd		nd	nd			
Naphthalene	50	nd		250	nd			
Hexachloro-1,3-butadiene	50	nd		nd	nd			
1,2,3-Trichlorobenzene	50	nd		nd	nd			

*Instrument detection limits

TABLE 7

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WASHINGTON DEPARTMENT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Analytical Results

8260, µg/kg		MTH BLK	LCS	B1-5-16	B2-1-12	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Date extracted	Reporting	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	
Date analyzed	Limits	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	

Surrogate recoveries

Dibromofluoromethane	96%	94%	91%	90%	94%	96%
Toluene-d8	99%	100%	99%	98%	102%	98%
4-Bromofluorobenzene	102%	101%	100%	96%	104%	98%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

Acceptable Recovery limits: 65% TO 135%

Acceptable RPD limit: 35%

Table 8

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WASHINGTON DEPARTMENT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Analytical Results

8270, mg/kg	MTH BLK		LCS	B1-5-16	B2-1-12	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Date extracted	Reporting	04/23/03	04/23/03	04/23/03	04/23/03	04/24/03	04/24/03	
Date analyzed	Limits	04/23/03	04/23/03	04/23/03	04/23/03	04/24/03	04/24/03	
Penatchloroethane	0.10	nd		nd	nd			
Bis (2-chloroethyl) ether	0.10	nd		nd	nd			
1,3-Dichlorobenzene	0.10	nd		nd	nd			
1,4-Dichlorobenzene	0.10	nd		nd	nd			
1,2-Dichlorobenzene	0.10	nd		nd	nd			
2-Methylphenol (o-cresol)	0.10	nd		nd	nd			
Bis (2-chloroisopropyl) ether	0.10	nd		nd	nd			
3,4-Methylphenol (m,p-cresol)	0.10	nd		nd	nd			
2-Nitrophenol	0.50	nd		nd	nd			
Bis (2-chloroethoxy) methane	0.10	nd		nd	nd			
1,2,4-Trichlorobenzene	0.10	nd		nd	nd			
Naphthalene	0.10	nd		0.23	1.0			
Hexachloropropylene	0.50	nd		nd	nd			
Hexachlorobutadiene	0.50	nd		nd	nd			
1,2,4,5-Tetrachlorobenzene	0.10	nd		nd	nd			
Hexachlorocyclopentadiene	0.10	nd		nd	nd			
2,4,5-Trichlorophenol	0.50	nd		nd	nd			
2-Chloronaphthalene	0.10	nd		nd	nd			
Dimethylphthalate	0.10	nd		nd	nd			
Acenaphthylene	0.10	nd	93%	nd	nd	96%	114%	17%
Acenaphthene	0.10	nd		nd	nd			
2,4-Dinitrophenol	0.50	nd		nd	nd			
Pentachlorobenzene	0.10	nd		nd	nd			
Fluorene	0.10	nd		nd	nd			
Diethylphthalate	0.50	nd		nd	nd			
4-Chlorophenylphenylether	0.10	nd		nd	nd			
N-Nitrosodiphenylamine	0.10	nd		nd	nd			
4-Bromophenylphenylether	0.10	nd		nd	nd			
Hexachlorobenzene	0.10	nd		nd	nd			
Phenanthrene	0.10	nd		nd	nd			
Anthracene	0.10	nd		nd	nd			
Di-n-butylphthalate	0.10	nd		nd	nd			
Fluoranthene	0.10	nd		nd	nd			
Pyrene	0.10	nd	89%	nd	nd	94%	107%	13%
Butylbenzylphthalate	0.50	nd		nd	nd			
Benzo(a)anthracene	0.10	nd		nd	nd			
Chrysene	0.10	nd	97%	nd	nd	85%	95%	11%
Bis (2-ethylhexyl) ether	0.10	nd		nd	nd			
Di-n-octylphthalate	0.50	nd		nd	nd			
Benzo(b)fluoranthene	0.10	nd		nd	nd			
Benzo(k)fluoranthene	0.10	nd		nd	nd			
Benzo(a)pyrene	0.10	nd		nd	nd			
Dibenzo(a,h)anthracene	0.10	nd		nd	nd			
Benzo(ghi)perylene	0.10	nd		nd	nd			
Indeno(1,2,3-cd)pyrene	0.10	nd		nd	nd			

Table 8

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WASHINGTON DEPARTMENT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Analytical Results

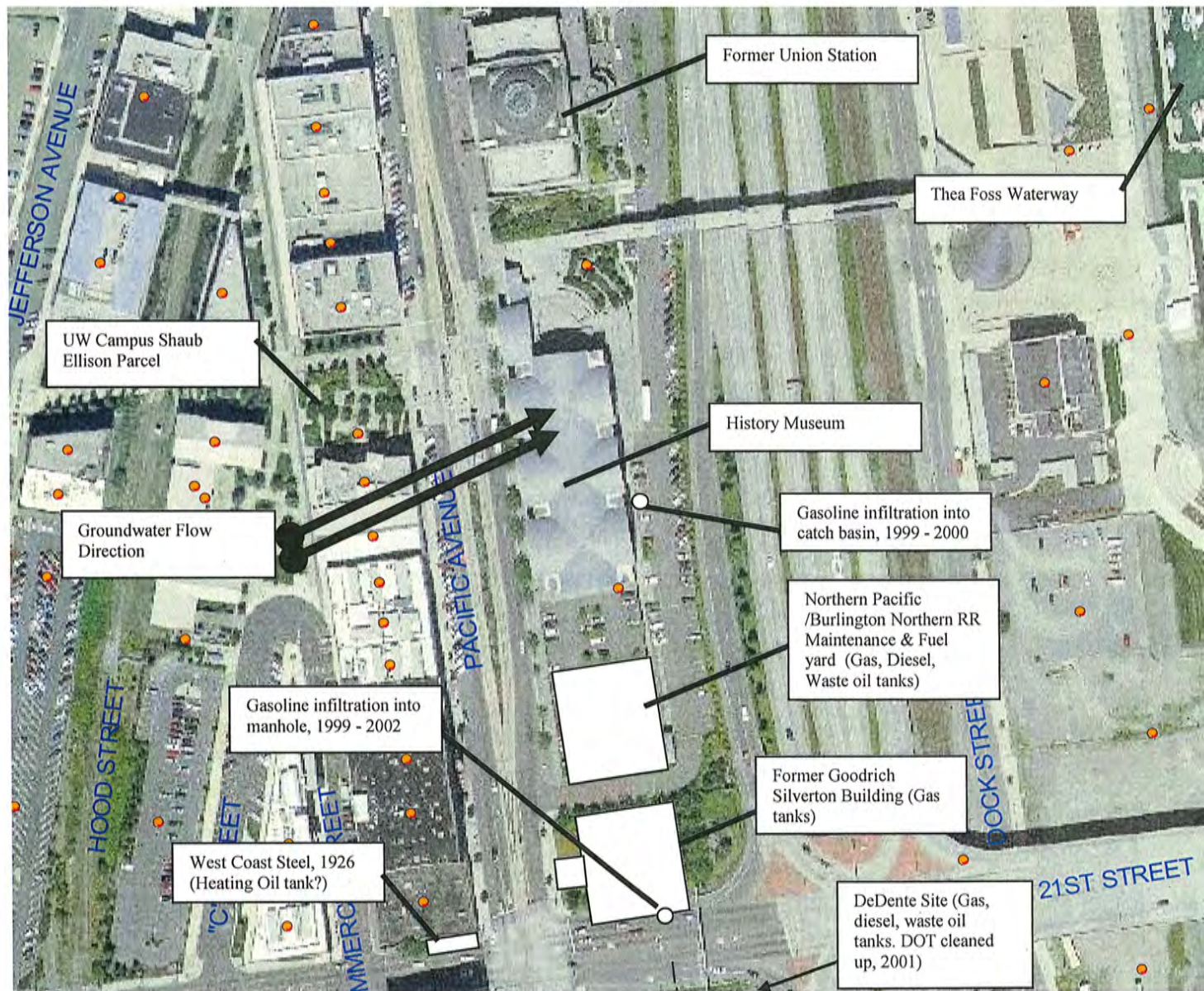
8270, mg/kg		MTH BLK	LCS	B1-5-16	B2-1-12	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Date extracted	Reporting	04/23/03	04/23/03	04/23/03	04/23/03	04/24/03	04/24/03	
Date analyzed	Limits	04/23/03	04/23/03	04/23/03	04/23/03	04/24/03	04/24/03	

Surrogate recoveries

Nitrobenzene-d5	110%	105%	111%	114%	103%	103%
2-Fluorobiphenyl	100%	96%	99%	101%	95%	93%
4-Terphenyl-d14	93%	91%	92%	96%	87%	85%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%



North ↑

Figure 1
Pugnetti Park/Former Union Station Overview

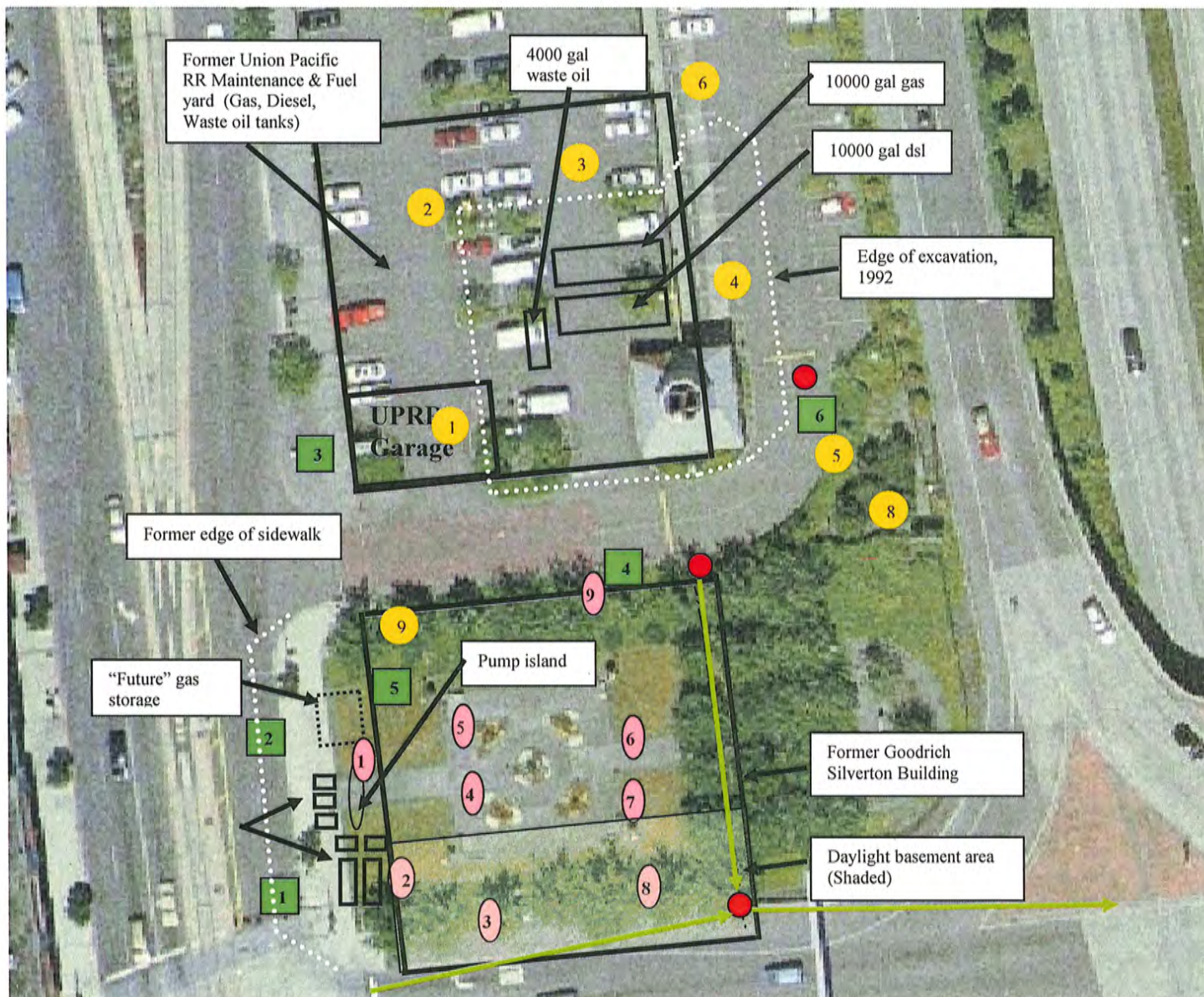


Figure 2
Pugnetti Park Investigation Schematic

- 1 Pugnetti Park Clean Sites Initiative and Initial Investigation Monitoring Wells
- 4 Pugnetti Park Clean Sites Initiative Boring Locations
- 9 Washington State History Museum Former Well Locations (Bison Engineering, 2/93)
- Manhole
- Storm Drain Line

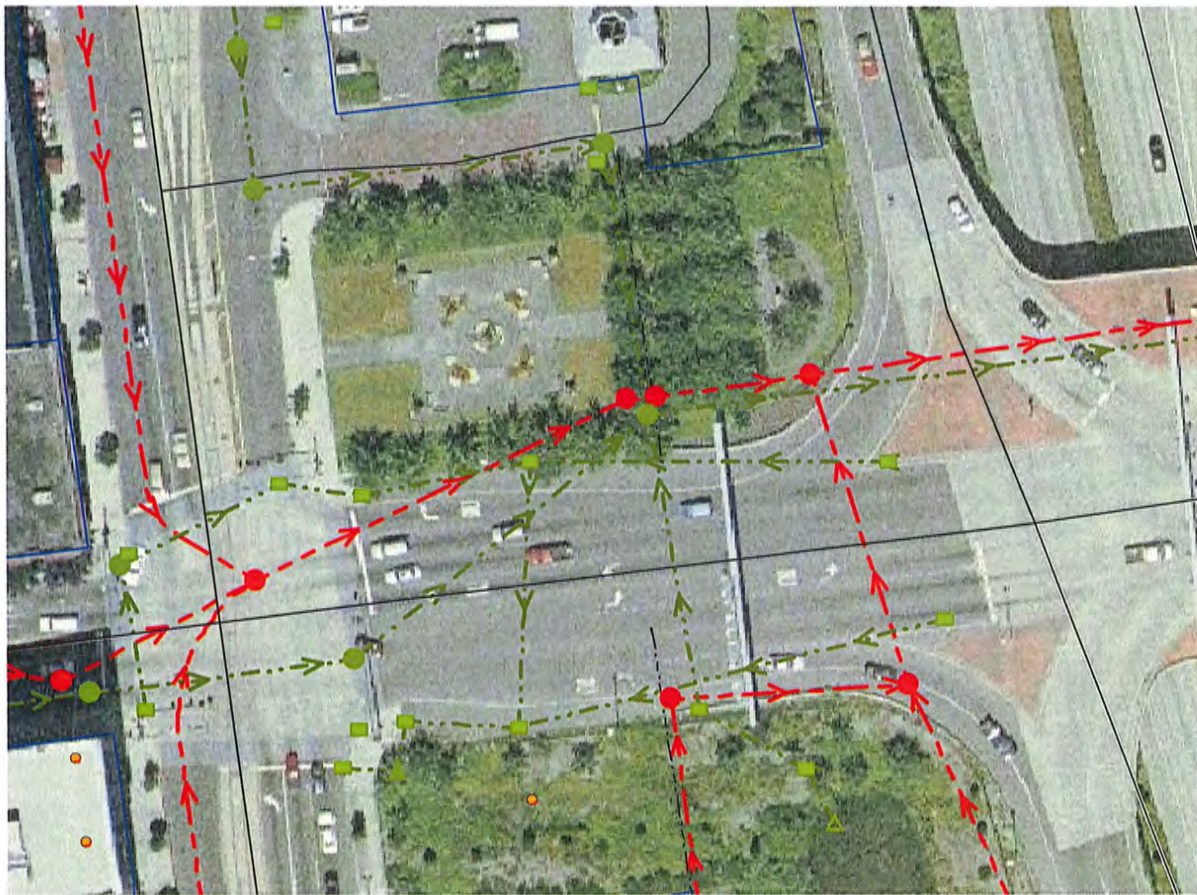


Figure 3
Pugnetti Park Vicinity –
Storm and Sewer Drain Configuration

Red: Sanitary Sewers
Green: Storm Sewers

APPENDIX A

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The search retrieved 15 matches. Displaying full information for number 15 of 15 below.

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Search Match Number 15

Address: 1955 PACIFIC AVE., Tacoma

Style: American

Built: 1889

Demolished

Notes: Arlington Hotel

Jim Dorsey, builder

C. Langlois, arch.

W.J. Foster, contr.

-later renamed the Hotel Rhein

-a bldg. at 410 So. 21st St. was also called the Hotel Rhein

-b2003,11-12

-formerly 2021-23 Pacific Ave.

TDL 6/25/1889 p.5 . . . will build a new hotel

TDL 12/29/1889 p.5 (ad)

TDL 1/1/1890 p.9 permits

TDL 11/16/1930 p.D8 (bldg. to be demolished to make way for the

Goodrich Silvertown Bldg.)

TDL 11/23/1930 p.D8 Famous for forty years, to be razed (il)

917.972 T37 p.101,176

2 images linked to this address:



Look at additional image(s) in the [General Photographic Collection database](#)? These may be further images of the building, or the contents, events occurring at this address, or other aspects that may not illustrate the building itself.

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Detail on Image #BU-11870 (Image 2 of 2)

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ADDRESS: 1955 PACIFIC AVE.

CITY: Tacoma

DATE: unknown

PHOTOGRAPHER: Bicentennial Project

TYPE: copyprint - copy of original print

SIZE: 8x10 - standard 8x10-inch size

SOURCE: TPL Historic Building Files

IMAGE NUMBER: BU-11870

COMMENTS:

CD-ARCHIVE:

INTERNAL NUMBER: TPL389, 75346-2

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Search Match Number 14

Address: 1955 PACIFIC AVE., Tacoma

Built: 1931

Notes: Goodrich Silverton, Inc.
Wm. Mellema, arch.
Jack Roth, construction engineer
Roberts & Johnson, contr.
-Hollowstone concrete and tile
-site includes 1955-63 Pacific Ave.
TDL 11/4/1930 p.9 Rubber co. to erect building
TDL 11/9/1930 p.D8 Goodrich building to cover one block
TDL 11/16/1930 p.D8 New buildings proposed ...
TDL 2/15/1931 p.D6 Goodrich Bldg. in construction
TDL 3/1/1931 p.D6 Slab is poured for tire building
TDL 3/8/1931 p.D8 (sketch)
TDL 6/4/1931 p.4,5 All ready for dedication of new tire home (sketch)
TDL 6/7/1931 p.B8,B9 Throngs visit Goodrich home (il,interior il)
TDL 6/14/1931 p.E10 (interior il)
TDL 3/3/1935 p.A9 (interior il)
TNT 8/12/1937 p.7 (il)
TNT 12/13/1940 p.21 Goodrich expanding (il)
307.76 Un3T p.96

2 images linked to this address:



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60 mph with driver Greg Marion swerving to avoid cars and blowing his horn. Near Silvertown, the truck hit a fire hydrant, hurling it 50 yards and demolishing a shed in the center of the gas pump stand, uprooted a gas pump, sent its rear wheels through a plate glass window and came to rest a few yards later. Miraculously, only 2 people were hurt and none seriously. (T. Times 8/30/1939, pg. 1)

Address: 1955 Pacific Ave.

Subjects: Goodrich Silvertown Stores (Tacoma); Automobile equipment & supplies stores--Tacoma--1930-1940; Automobile service stations--Tacoma--1930-1940; Traffic accidents--Tacoma--1930-1940;

Photographer: City photographer

Image type: Black & White

Original negative: 4x5"

Negative type: AGFA Safety film

Print type: Fiber base-Glossy

Print format: 8x10"

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about 32nd Street. The truck gained momentum down the steep slope, but driver Marion was able to steer the truck around surrounding vehicles. At around 21st and Pacific, his luck ran out. The truck grazed a Tacoma Grocery Co. truck, hit a fire hydrant hurling it 50 yards across the street, sent its back wheels through the Silvertown's plate glass office windows, uprooted a gas pump and, its momentum broken, came to rest in the street. Miraculously, only two people were injured and those only slightly. Driver Marion was unhurt. (T. Times 8/30/1939, pg. 1)

Address: 1955 Pacific Ave.

Subjects: Goodrich Silvertown Stores (Tacoma); Automobile equipment & supplies stores--Tacoma--1930-1940; Automobile service stations--Tacoma--1930-1940; Traffic accidents--Tacoma--1930-1940;

Photographer: City photographer

Image type: Black & White

Original negative: 4x5"

Negative type: AGFA Safety film

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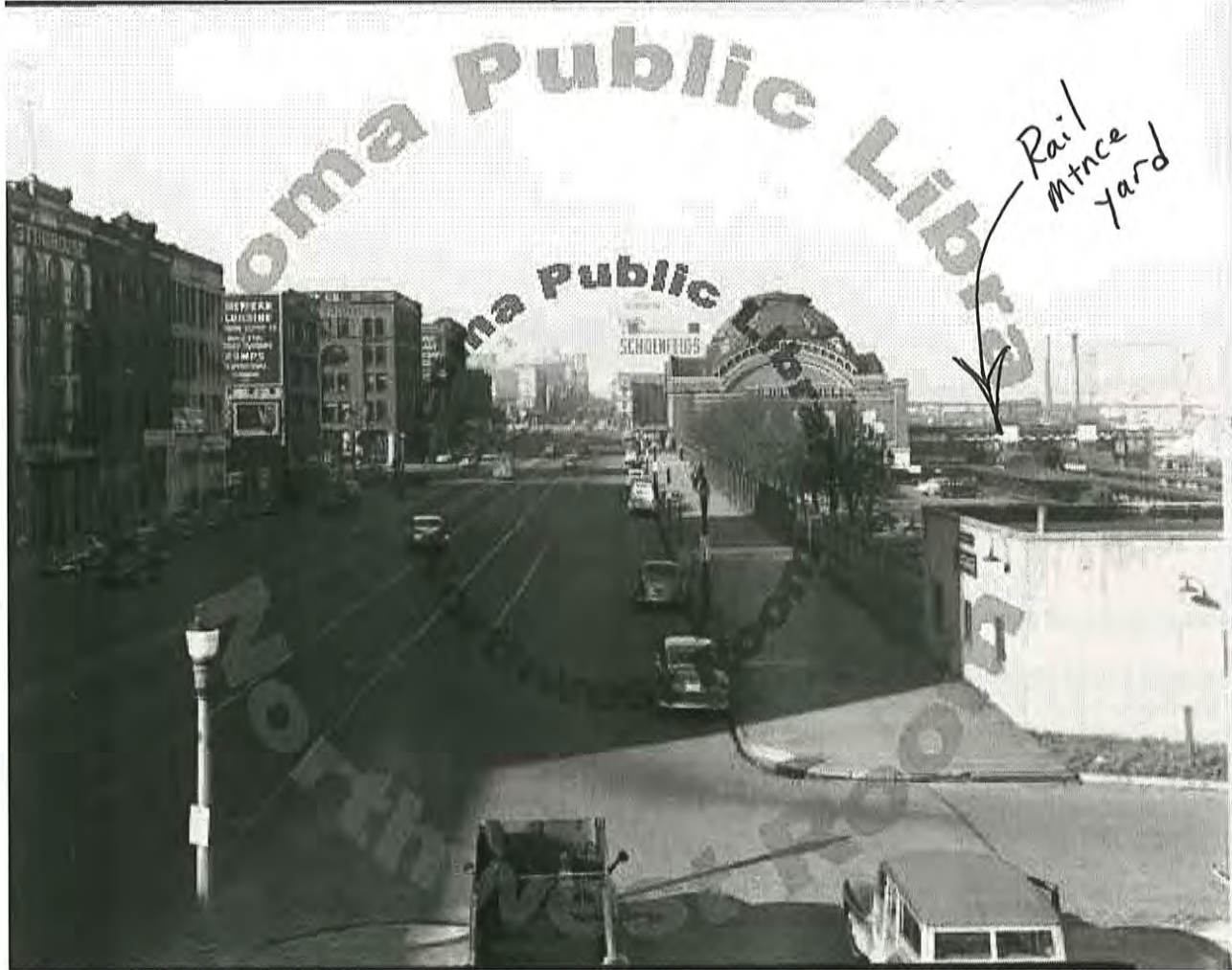
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American Plumbing and Steam Supply Co. (1908-16) and Goodyear Tire & Rubber Co. is on the corner of Pacific and 19th. Streetlights are on either side of the wide thoroughfare. TPL-9382

Subjects: Commercial streets--Tacoma--1950-1960; Business districts--Tacoma--1950-1960; Union Station (Tacoma);

Image type: Black & White

Print type: Fiber base-Glossy

Print format: 8x10"

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CITY: Tacoma

DATE: 01 Feb 1971

PHOTOGRAPHER: William Trueblood Collection

TYPE: print - original print

SIZE: 8x10 - standard 8x10-inch size

SOURCE: TPL Historic Building Files

IMAGE NUMBER: BU-10748

COMMENTS:

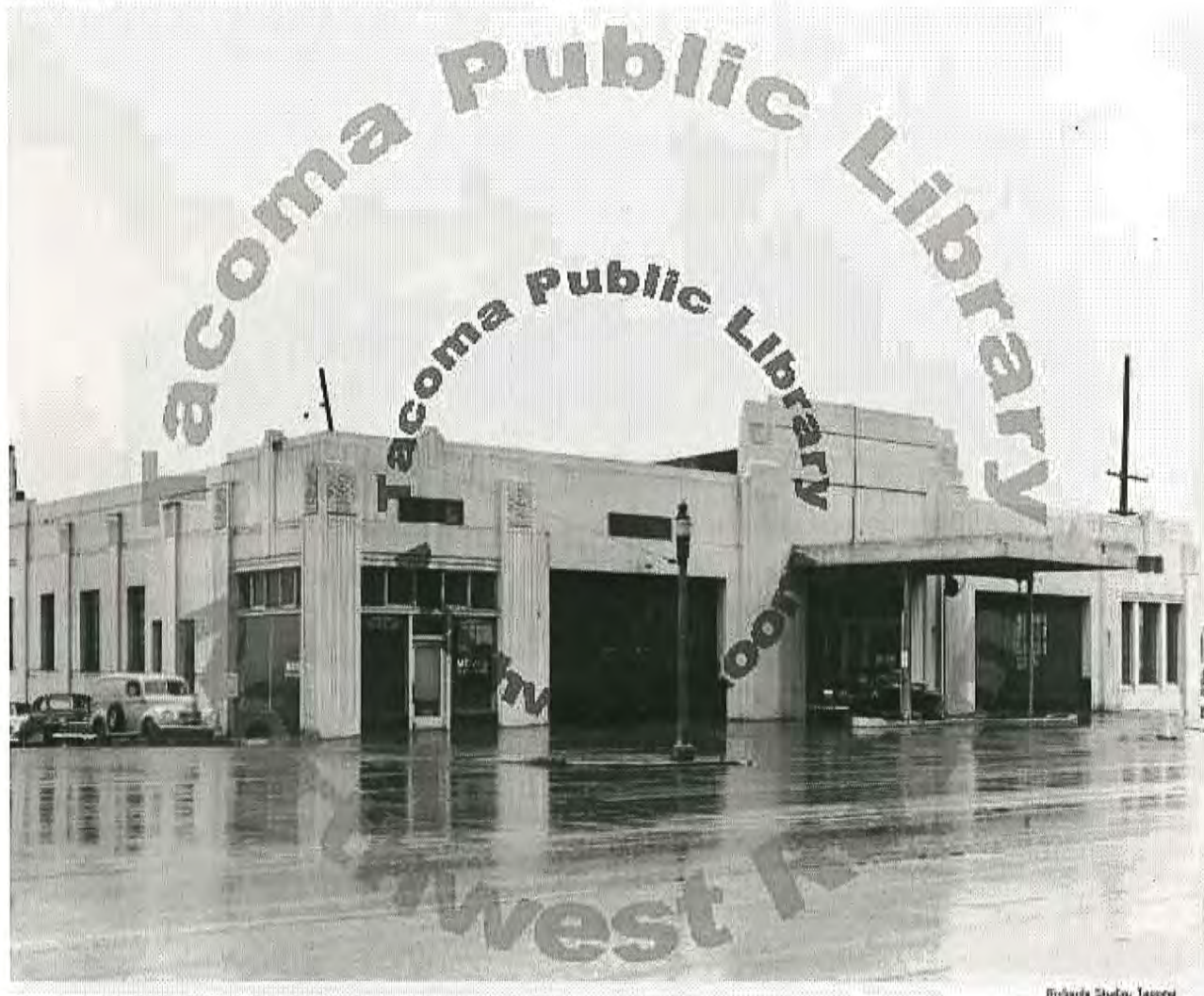
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Richards Studio, Tacoma

1 of 15 - [Center the Image...](#) | [Order a copy of this image](#) | [Recognize the contents?](#)**Collection:** Richards Studio Collection **Series:** A54616-3 **(Unique:** 19806)**Date:** 11-30-1950**Description:** The exterior of the old B.F. Goodrich building. B.F. Goodrich moved to their new location at 707 Pacific Avenue in May 1950. Lloyd Suiter Tire Company had taken over this location by 1951. Lloyd Suiter had formerly been located at 2302 Pacific Avenue. Lloyd Suiter died in April 1949. Ted L. Fix served as president of the

Lloyd Suiter Tire Company in 1951. Wesley Maitland served as secretary. Ordered by Lloyd Suiter Tire Company, Mrs. McGorran.

Address: 1955 Pacific Ave.

Subjects: Commercial facilities--Tacoma; Lloyd Suiter Tire Co. (Tacoma); B.F. Goodrich Co. (Tacoma);

Image type: Black & White

Print type: Fiber base-Glossy

Print format: 8x10"

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Tacoma Public Library

Northwest Room

Pierce County Buildings Index [Enter a Search](#)

Detail on Image #BU-2323 (Image 1 of 2)

Use the Back Button to return to the Address Record

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ADDRESS: 1955 PACIFIC AVE.

CITY: Tacoma

DATE: 1977

PHOTOGRAPHER:

TYPE: snapshot - small format snapshot

SIZE: 3.5x5 - snapshot size or smaller

SOURCE: Cultural Resource Survey

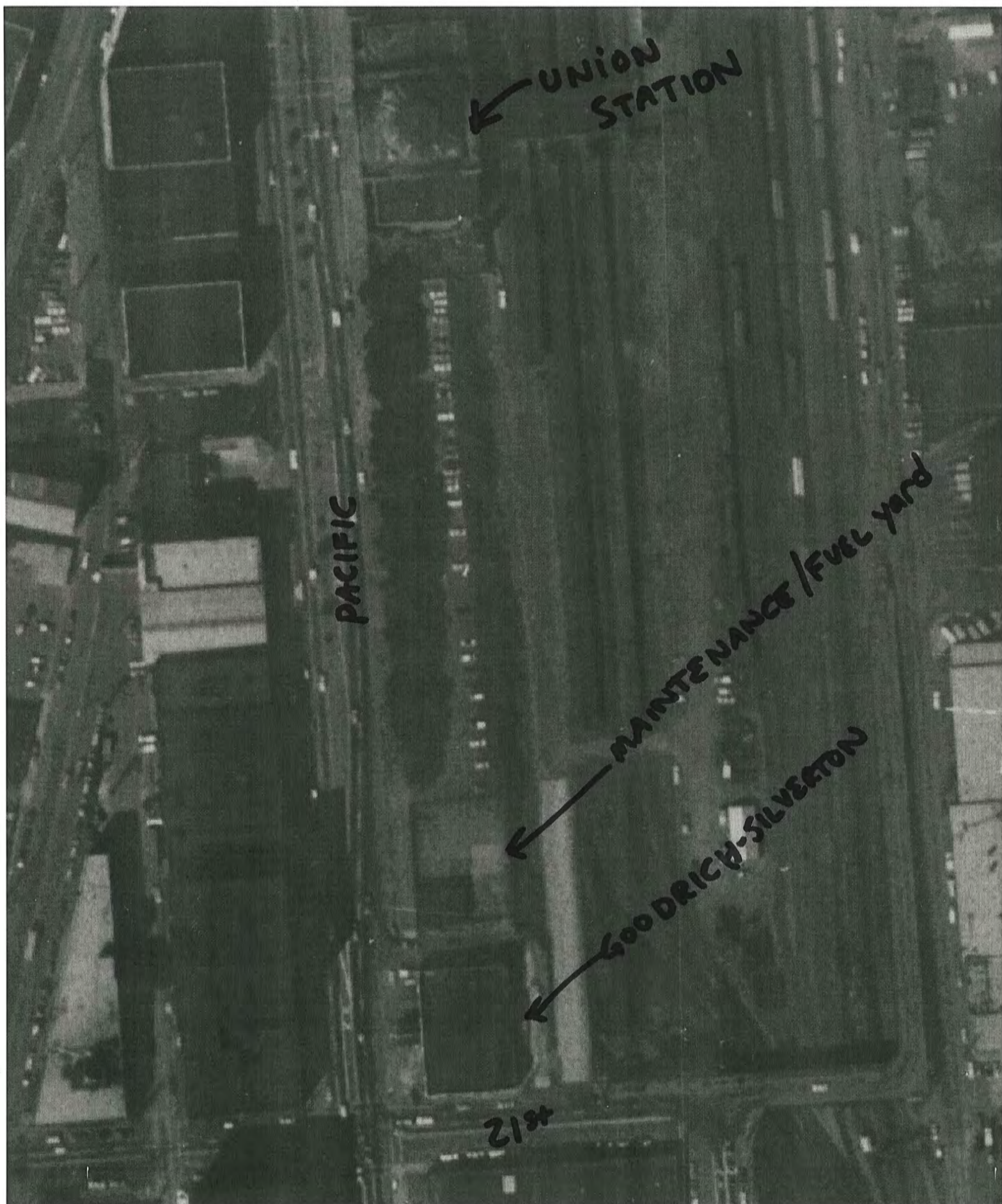
IMAGE NUMBER: BU-2323

COMMENTS:

CD-ARCHIVE:

INTERNAL NUMBER:

RIGHTS: All Rights Reserved Tacoma Public Library ([Order a copy of this Image?](#))



N↑

1974 From: City of Tacoma Gov-me Site

B.F. Goodrich Rubber Co.

Opened June 4, 1931

Frank Fox, Mgr.

Complete auto service and repair, except body work.

Lubrication pits

'Tyrewelder' vulcanizing equipment

Tire supply depot for southwest Washington

USL Battery distributor

Large assortment of fuels and lube oils

(Shell Oil, Standard Oil Co. of California, Associated Oil Co., Texaco)

High-speed gas pumps ('Standard' gas, 'Zerolene'-Mobiloil)

Closed in 1950's

(based on news clippings)

t. naccarato

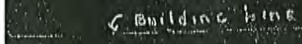
City of Tacoma - Stormwater Inspector

RECEIVED

FEB 07 2000

Tacoma-Pierce County
Health Department

SOUTH. 21ST.



2 SIDE WALK.

Space For
Future Gasoline
Storage

SEE SURVEY FOR PUBLIC UTILITIES.

Drive way.

SIDEWALK.

DRIVE WAY.

Proff.

Back of
Blueprint

Goodrich - Silvertown Inc.
1855 Pacific
No bond Road.

2-24-1931
10-17-31-clearance
91F

CITY OF TACOMA

OFFICE OF CITY ENGINEER

No

2

OIL AND GASOLINE TANK CLEARANCE

Date 2-20- 1931

This certifies that Roy Thompson

has this date filed in this office plans for Gasoline tanks and appurtenances
to be located at 1955 Pacific Ave

Bond not required

☒

Bond filed

☐

Approved as to location C. E. Putman

City Engineer by G. I. Finkel

Approved as to Fire Regulation

Fire Chief by

NOTE—Excerpt from Ordinance No. 10627—"No work shall be commenced on said tank until after a permit shall have been issued. Said permit shall, in the case of tanks located on private property, be issued by the Building Inspector of the City of Tacoma, and in the case of tanks located on any street, alley or other public place, by the Commissioner of Public Works, only upon presentation of permit issued by Fire Marshal."

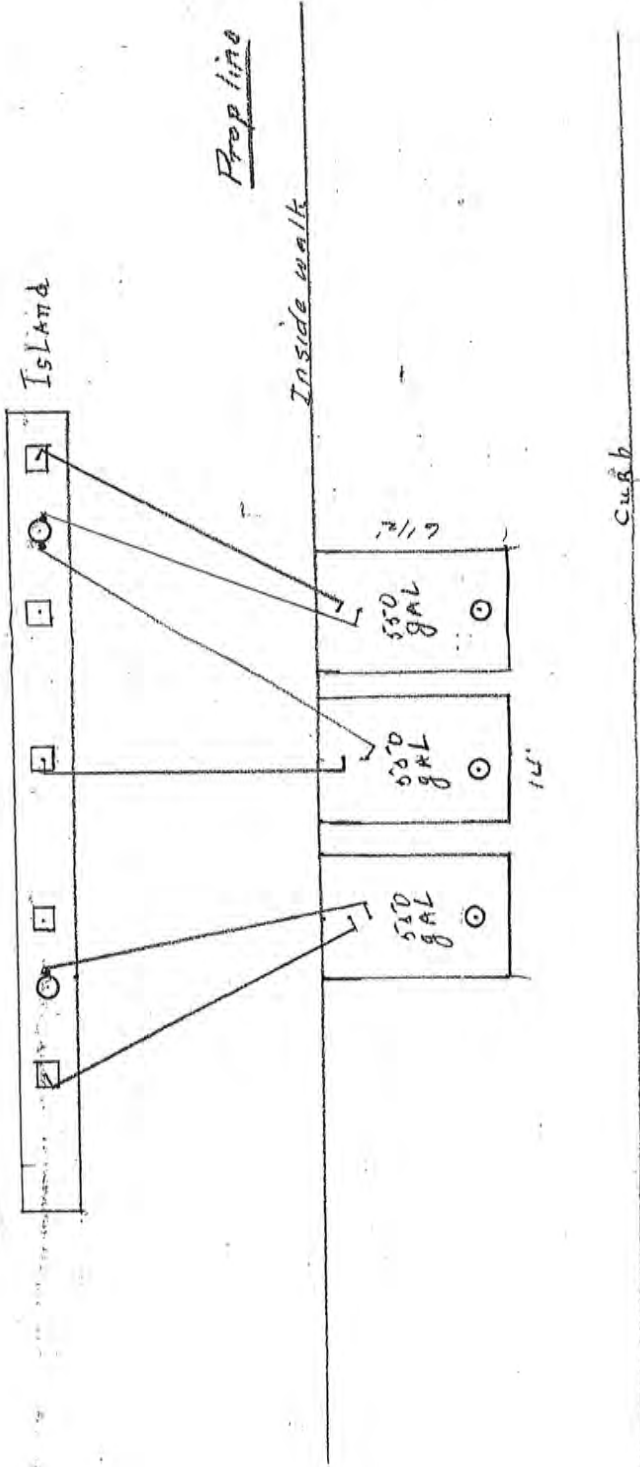
L. Q. Wood

Geotrich - Leptotricha

March 1-1933

1955 Pacific Ave

Building Line





COMMONWEALTH TITLE INSURANCE COMPANY

WASHINGTON TITLE INSURANCE COMPANY
PRELIMINARY COMMITMENT LETTER



All Title Insurance Policies issued by this
Company are Reinsured by
Lonear National Title Insurance Company

1120 PACIFIC AVENUE • TACOMA, WASHINGTON 98402

(206) 383-1476

PRELIMINARY COMMITMENT FOR TITLE INSURANCE

RL-0263

To: State of Washington

No. 332 688

Pugnetti Park Title kept from DOT.

Date: March 20, 1980 at 8:30 a.m.	Amount	Premium
x Owner's standard coverage	\$7,500.00	\$141.50
Purchaser's standard coverage		
Mortgagee's standard coverage		
Mortgagee's ALTA coverage		

In the event this transaction fails to close, a cancellation fee will be charged for services in accordance with our schedule.

COMMONWEALTH TITLE INSURANCE COMPANY agrees to issue on request within six months and on recording of any appropriate documents, its policy or policies as applied for, with coverage as indicated, based on this preliminary commitment that title to the property described herein is vested on the date shown above in

EARL C. MAITLAND and IRENE MAITLAND, husband and wife;

subject only to the exceptions shown herein and to the terms, conditions and exceptions contained in the policy form.

This report and commitment shall have no force or effect except as a basis for the coverage specified herein.

By *[Signature]*
Validating Officer

DESCRIPTION OF PROPERTY IN PIERCE COUNTY, WASHINGTON

Lots 11 and 12, Block 2003, MAP OF NEW TACOMA, WASHINGTON TERRITORY, according to plat filed for record February 3, 1875 in the office of the County Auditor.

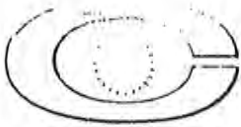
SUBJECT TO:

1. General taxes for the year 1980, payable in the amount of \$533.22. (Tax Parcel No. 202003-003-0)
2. Lien of real estate excise sales tax upon any sale of said premises, if unpaid.
3. Notice of additional sewer facility connection charge, pursuant to RCW 65.08.170 and 180 which statute provides that said notice is effective until a certificate of payment and release containing a legal description is recorded.
MUNICIPALITY: City of Tacoma
RECORDED: November 1, 1978
AUDITOR'S FEE NO.: 2864651
COVER SHEET CORRECTED by instrument recorded January 12, 1979 under Auditor's Fee No. 2881434.

John L. Sodergren, Appraiser

Parcels Nos. 3-06026 & 3-06027

3-06026



COMMONWEALTH
TITLE INSURANCE
COMPANY

WASHINGTON STATE ASSOCIATION
PRELIMINARY COMMITMENT FORM



All Title Insurance Policies issued by this
Company are Reinsured by
Lionel National Title Insurance Company

1120 PACIFIC AVENUE • TACOMA, WASHINGTON 98402

(206) 383-1476

PRELIMINARY COMMITMENT FOR TITLE INSURANCE

No. 332 688
Page 2

- (1) NOTE: A security interest in the following items or types of Collateral disclosed by Financing Statement filed in the Office of the County Auditor.
COLLATERAL: All equipment, tools, machinery, service trucks, and equipment, etc., located at 1955 Pacific Avenue, Tacoma, Washington, and 10514 Bridgeport Way S.W., Tacoma, Washington
DEBTOR: Wested Tire Company, Inc.
SECURED PARTY: Earl C. Maitland
FILED: March 25, 1976
AUDITOR'S FEE NO.: 136682
- (2) NOTE: Record owners acquired title to an undivided one-half interest in said premises by deed recorded February 2, 1978 under Auditor's Fee No. 2796727 (Excise Tax Receipt No. 447710 - \$150.00) and to the other undivided one-half interest by deed recorded May 22, 1978 under Auditor's Fee No. 2822900. (Excise Tax Receipt No. 457932 - \$155.00)
- (3) NOTE: Address of record owners from tax rolls:
1955 Pacific Avenue, Tacoma, WA 98402

Title is to vest in the State of Washington.

(END OF COMMITMENT)

0321F/1042A
NTH/3/26/wc

NOTE: The language contained in the printed Exclusions from Coverage and Conditions and Stipulations of the policy committed for may be examined by inquiry at the Commonwealth Title Insurance Co. office which issued the Commitment, and a specimen copy of the insurance policy form (or forms) referred to in this commitment will be furnished promptly upon request.

NOTE: Investigation should be made to determine if there are any service, installation, maintenance, or construction charges for garbage collection and disposal, sewer, water, telephone, gas or electricity.

[illegible]

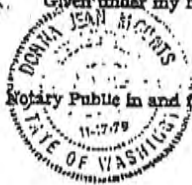
EXECUTOR'S DEED
Shelburne Land Bank Co. Shelburne, Vt. Form No. 403

2796727

Notary Public in and for the State of Washington, residing at _____, do hereby certify that on this _____ day of _____, A. D. 19____, before me personally appeared _____, as _____ and trustee of the estate of _____, deceased, to me known to be the individual described in and who executed the within instrument and acknowledged to me that _____ he signed and sealed the same as _____ his _____ free and voluntary act and deed, in the capacity and for the purposes therein mentioned.

I, Donna Jean Monte, a notary public in and for the State of Washington, residing at Bozeman in the above named county and state, duly commissioned, sworn and qualified, do hereby certify that on this 31st day of January, A. D. 1978, before me personally appeared John G. Siegle, Jr., as execut. OR and trustee of the estate of Margaret A. Hueval, deceased, to me known to be the individual described in and who executed the within instrument and acknowledged to me that _____ he signed and sealed the same as _____ his _____ free and voluntary act and deed, in the capacity and for the purposes therein mentioned.

Given under my hand and official seal the date in this certificate stated



Donna Jean Monte
Notary Public in and for the State of Washington, residing at Bozeman



EXECUTOR'S DEED

(NON-INTERVENTION WELLS)

FROM

John G. Siegle, Jr.

Bozeman, Montana

10908 Eisenhower Terrace, NW

Bozeman, MT 59717



PIONEER NATIONAL
TITLE INSURANCE
ATTORNEY COMPANY

CE

SHED WITH
LE. THE
OF ITS ACQ
COMMONW
NO LIABILITY



1420 PACIFIC AVE.
TACOMA, WASHINGTON 98408

Statutory Warranty Deed

Form LWS

309 987

THE GRANTOR KATE RICHTER, as her separate estate.

for and in consideration of TEN DOLLARS AND NO/100 AND OTHER VALUABLE CONSIDERATION
in hand paid, conveyed and warrants to EARL C. MAITLAND and IRENE MAITLAND, husband and wife.
the following described real estate, situated in the County of PIERCE, State of Washington:

An undivided 1/2 interest in Lots 11 and 12, Block 2003, MAP OF NEW TACOMA, WASHINGTON TERRITORY, according to plat filed for record February 3, 1873 in the office of the County Auditor.

EXCISE TAX PAID \$15.50

RFC. NO. 457922 DATE 5-18-78

MAURICE RAYMOND Pierce Co. Treas.

By *Barth Jackson* DEPUTY

Dated this 16th OF
MAY, 1978

day of *Kate Richter* (SEAL)

CALIFORNIA
STATE OF WASHINGTON
County of LOS ANGELES

On this day personally appeared before me KATE RICHTER, as her separate estate,

to me known to be the individual described in and who executed the within and foregoing instrument, and acknowledged that she signed the same as her free and voluntary act and deed, for the uses and purposes therein mentioned.

GIVEN under my hand and official seal this 16th

day of MAY, 1978

H. Phillip McQuown
Notary Public in and for the State of Washington,
residing at

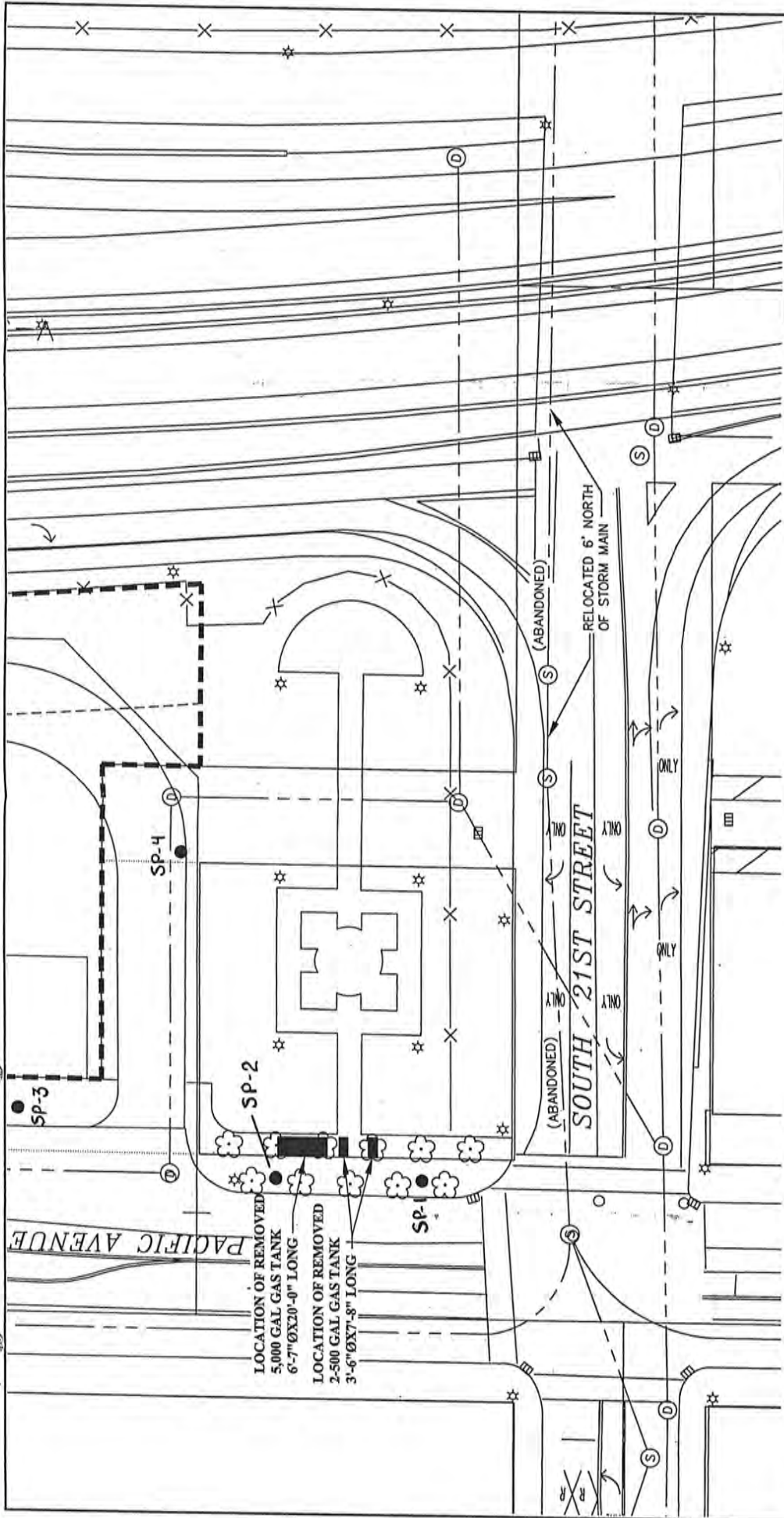


2822900

5-22-78

1382

Map from 2000 Utility Investigation



NOTES:

1. LOCATIONS OF REMOVED UT'S ARE BASED UPON BUILDING PLANS.
2. GIS BASE MAP DOES NOT REFLECT CHANGES MADE TO 21st STREET INTERSECTION FROM SR-509 CONSTRUCTION.

CITY OF TACOMA	
DEPARTMENT OF PUBLIC WORKS	
Pugnetti Park	
So. 21st Street & Pacific ave.	
GIS Information	
DATE	7/11/00
BY	TN
FOR	UTILITY SERVICES DEPARTMENT
BY	RG
FOR	UTILITY SERVICES
BY	TN
FOR	UTILITY SERVICES

RECEIVED
JUL 14 2000
Tacoma-Pierce County
Health Department

HORIZONTAL SCALE

1" = 40'

This drawing is neither a legally recorded map nor a survey and is intended to be used as one. To be used for reference purposes only. The City of Tacoma is not responsible for any inaccuracies herein contained.

APPENDIX B



ENVIRONMENTAL & EXPLORATION GEOPHYSICS

437 N.E. LIBERTY AVE. GRESHAM, OR 97030 • PH (503) 665-7520 • FAX (503) 492-4404

E-Mail: rpsiii@aol.com

SUMMARY REPORT

SUBSURFACE MAPPING SURVEY FOR UNDERGROUND STORAGE TANKS

**PUGNETTI PARK
S. 21ST STREET & PACIFIC AVENUE
TACOMA, WASHINGTON**

CLIENT

**WASHINGTON DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE
300 DESMOND DRIVE SOUTHEAST
P.O. BOX 47775
OLYMPIA, WA 98504-7775**

June 18, 2001

GeoPotential Project Number 3818

CONTENTS

INTRODUCTION --- PAGE 1.
TIMING --- PAGE 1.
SURVEY OBJECTIVES --- PAGE 1.
SURVEY SITE - PAGE 1.
SURVEY SPECIFICATIONS - PAGE 1.
RESULTS - PAGE 2.
LIMITATIONS - PAGE 3.

FIGURES

FIGURE 1. - MAGNETIC MAP
FIGURE 2. - INTERPRETATION MAP
FIGURE 3. - GPR PROFILE P0
FIGURE 4. - GPR PROFILE P5

APPENDIX

MAGNETIC SURVEYS
GROUND PENETRATING RADAR SURVEYS

INTRODUCTION

GeoPotential performed a SUBSURFACE MAPPING SURVEY for the Washington Department of Ecology, Olympia, Washington. SUBSURFACE MAPPING SURVEYS are geophysical surveys that utilize geophysical data and methods to identify and map the locations of subsurface features.

Ralph Soule and Nikos Tzetos of GeoPotential performed the SURVEY.

TIMING

The field survey was completed on June 14, 2001. Report with maps was completed and mailed on June 18, 2001.

SURVEY OBJECTIVES

The SUBSURFACE MAPPING SURVEY was designed to map the location of UNDERGROUND STORAGE TANKS (USTS).

SURVEY SITE

The SURVEY SITE consisted the western portion of Pugnetti Park located at the intersection of South 21st Street and Pacific Avenue in Tacoma, WA.

Historical information provided by the Washington Department of Ecology indicated that the park had previously been a service station with three USTS located in the vicinity of the current sidewalk. The historical information was unclear as to whether the USTS had been removed from the SITE. The SUBSURFACE MAPPING SURVEY was designed to determine if the USTS had been removed from the SITE and to search for any other USTS that may occur on the SITE.

There were no surface indications of USTS. Surface features consisted of a rod iron fence, yard lights, three monitoring wells, a fire hydrant and water vaults.

SURVEY SPECIFICATIONS

Four instruments were used to conduct the survey:

- GEOMETRICS 858G MAGNETOMETER (MAGNETIC SURVEY).
- SCHONSTEDT GA52B MAGNETIC GRADIOMETER (GA52 SURVEY).
- MALA RAMAC GROUND PENETRATING RADAR (GPR SURVEY).
- AQUA-TRONICS A6 TRACER (A6 SURVEY).

MAGNETIC SURVEYS can detect USTS, buried waste drums, conductive utilities and other buried iron bearing (ferriferous) objects such as reinforced concrete. GPR surveys can detect both metallic and nonmetallic features. GA52 and A6 SURVEYS are useful for inspecting details of MAGNETIC and EM anomalies. The accompanying APPENDICES describes the use of MAGNETIC and GPR SURVEYS.

A rectangular grid was optically surveyed over the SITE and is shown as a grid on the MAPS.

The MAGNETIC SURVEY was conducted along traverses with a traverse interval of 5 feet. MAGNETIC data were then gridded and contoured to produce a MAGNETIC MAP (Figure 1) at a contour interval of 500 nanotesla for the SITE. The anomalous MAGNETIC HIGH anomalies that indicate subsurface ferriferous objects are colored red on the MAGNETIC MAP. MAGNETIC LOW anomalies are colored blue.

In general most of the MAGNETIC LOW anomalies on the MAPS are caused by surface ferriferous objects (vehicles, light poles, chain link fence, etc.) since the effect of having a ferriferous object above the magnetic sensor is to cause a predominantly MAGNETIC LOW ANOMALY. The effect of having ferriferous objects below the magnetic sensor (USTS, reinforced building foundations, ferric debris, etc.) is to cause a predominantly MAGNETIC HIGH ANOMALY. In the vicinity of surface ferriferous objects buried objects may not be detectable by the MAGNETIC SURVEY.

MAGNETIC ANOMALIES were interpreted to determine areas of significant buried metallic material, which may indicate USTS. These ANOMALIES were also inspected with GA52 and A6 SURVEYS.

A GPR SURVEY was conducted along the Profiles shown on Figure 2 – INTERPRETATION MAP. GPR PROFILES P0 and P5 are provided to show the location of possible UST PITS.

RESULTS

The results are shown on Figure 2 - INTERPRETATION MAP and on GPR PROFILES P0 and P5.

Figure 1 – MAGNETIC MAP

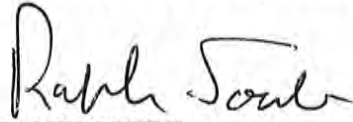
The MAGNETIC MAP demonstrates possible UST MAGNETIC HIGH ANOMALIES at 4 locations: (10E, 50N), (15E, 75N), (40E, 15N) and (55E, 70N). However the A6, GA52 and GPR SURVEYS over these features indicted that old piping and ferriferous debris caused these MAGNETIC ANOMALIES. No USTS were detected by the MAGNETIC SURVEY. Other MAGNETIC ANOMALIES are caused by subsurface utilities and minor debris.

Figure 2 – INTERPRETATION MAP

The GPR SURVEY detected possible UST PITS from the former USTS. On the GPR DATA shown on Figures 3 and 4 UST PITS show up as disturbed soil zones. The locations of these pits approximately corresponds with the locations of the former USTS from the historical maps.

LIMITATIONS

Geophysical surveys consist of interpreting geophysical responses from subsurface features. Since a variety of subsurface features can produce identical geophysical responses it is necessary to confirm the geophysical interpretation with intrusive investigations such as excavating or drilling. In addition many subsurface features may produce no geophysical response. The use of this SUBSURFACE MAPPING SURVEY is the sole responsibility of the CLIENT.



RALPH SOULE
GeoPotential

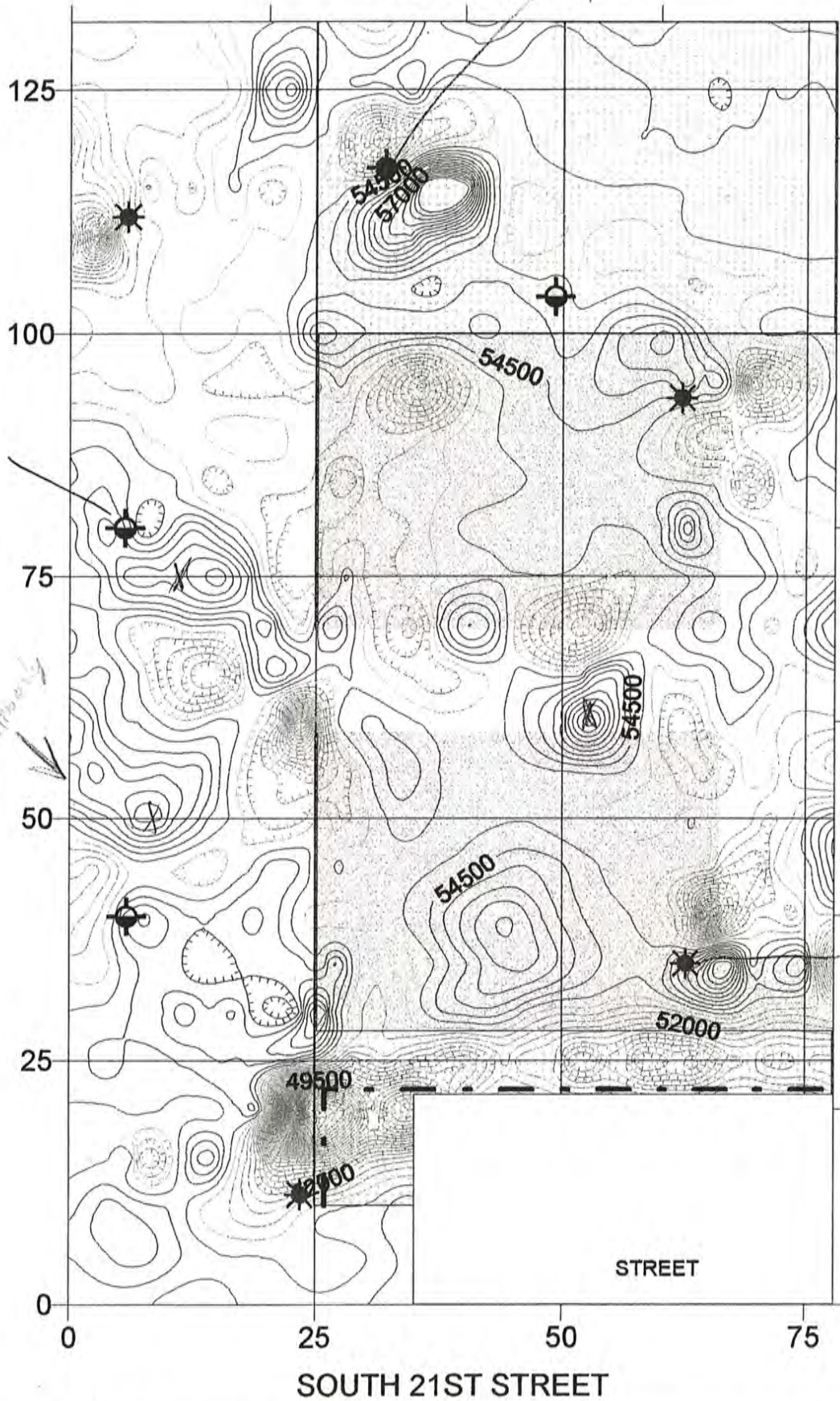
June 18, 2001

DRIVEWAY *hydrant*

well
PACIFIC AVENUE
Arroyo

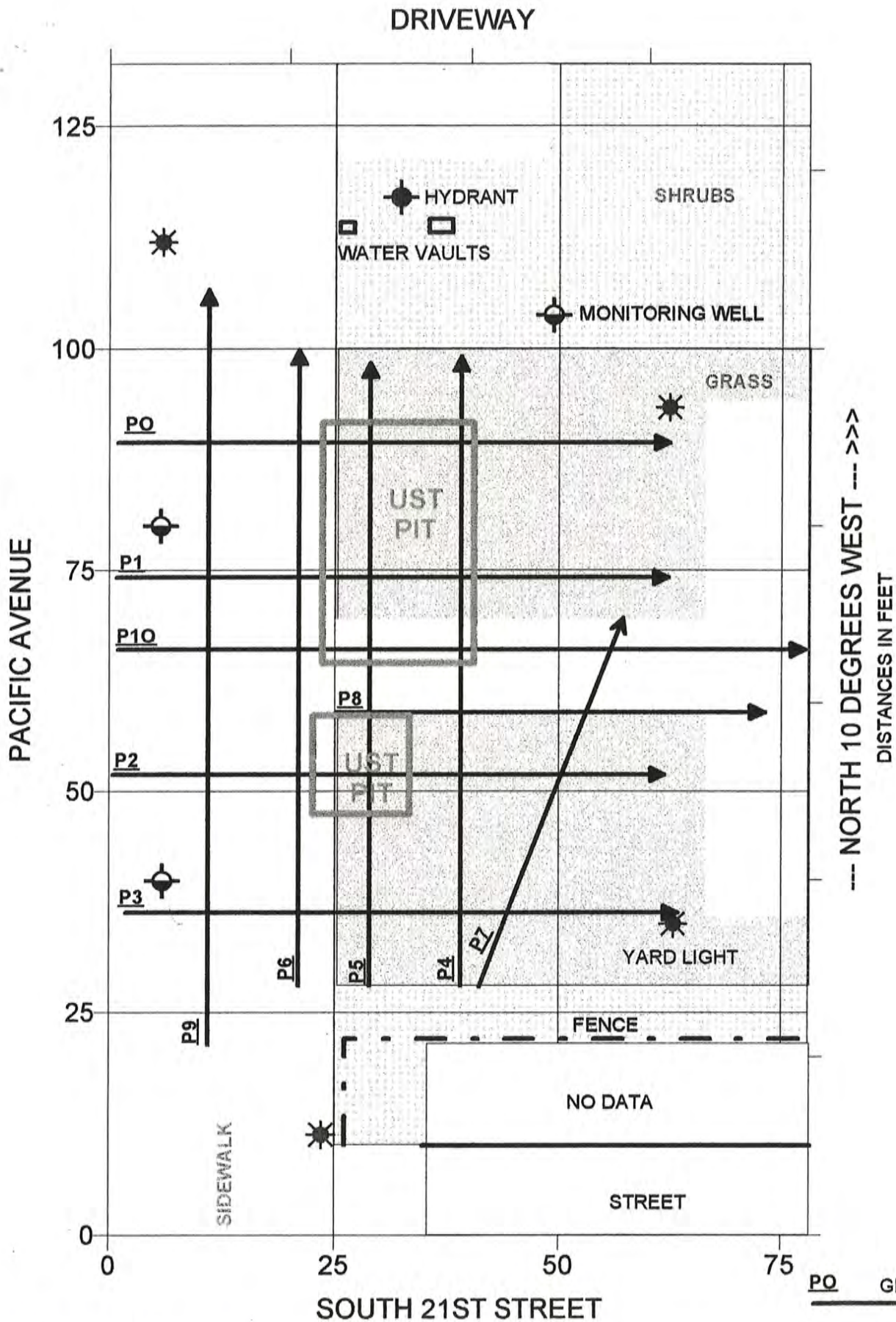
--- NORTH 10 DEGREES WEST --->>>
DISTANCES IN FEET

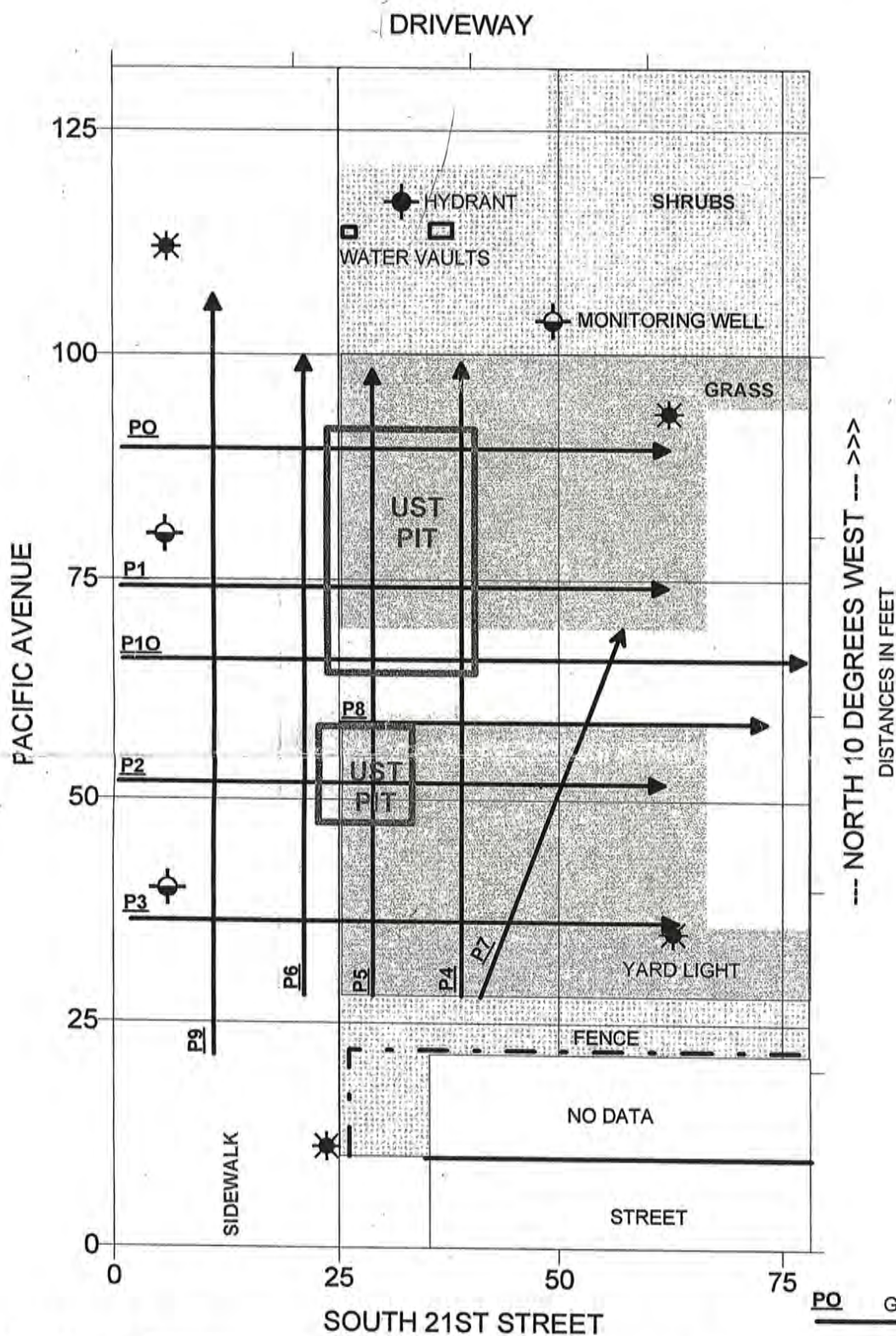
yard light



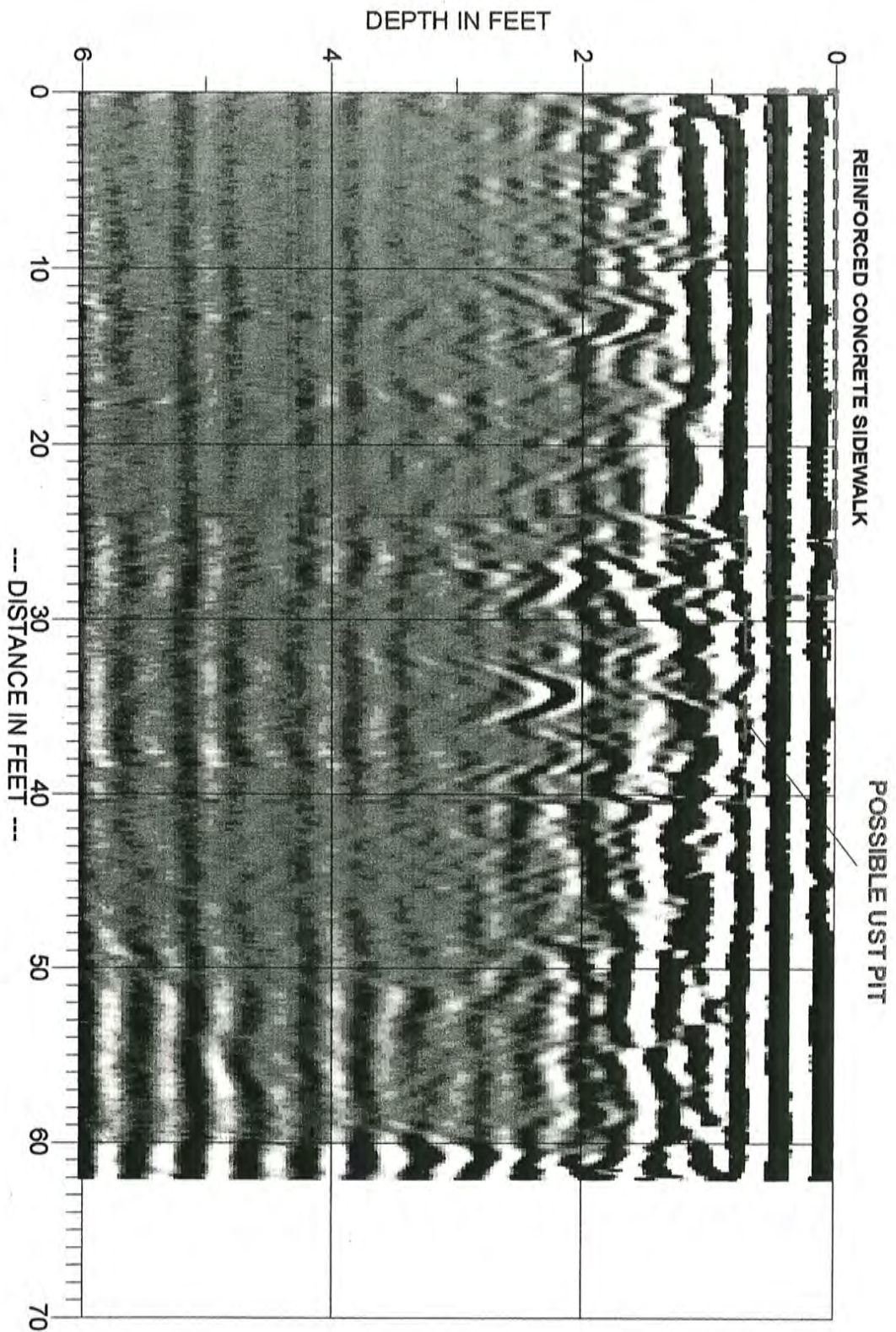
SOUTH 21ST STREET

	ENVIRONMENTAL & EXPLORATION GEOPHYSICS 437 N.E. LIBERTY AVE. GRESHAM, OR 97030 • PH (503) 665-7520 • FAX (503) 492-4404 E-MAIL GeoPotential@aol.com	LOCATION: PUGNETTI PARK S. 21ST STREET & PACIFIC AVENUE TACOMA, WASHINGTON	Figure 1 MAGNETIC MAP (C.I. = 500 nT)
	DATE: June 14, 2001 SUBSURFACE MAPPING SURVEY	PROJECT No. 3818 CLIENT: WASHINGTON STATE DEPARTMENT OF ECOLOGY	





 GeoPotential	ENVIRONMENTAL & EXPLORATION GEOPHYSICS 437 N.E. LIBERTY AVE. GRESHAM, OR 97030 • PH (503) 865-7520 • FAX (503) 492-4404 E-MAIL: GeoPotential@aol.com	LOCATION: PUGNETTI PARK S. 21ST STREET & PACIFIC AVENUE TACOMA, WASHINGTON	Figure 2 INTERPRETATION MAP
DATE: June 14, 2001	SUBSURFACE MAPPING SURVEY	PROJECT No. 3818	CLIENT: WASHINGTON STATE DEPARTMENT OF ECOLOGY



ENVIRONMENTAL & EXPLORATION GEOPHYSICS

437 N.E. LIBERTY AVE. GRESHAM, OR 97030 • PH (503) 685-7330 • FAX (503) 482-4404
E-MAIL: GeoPotential@aol.com

LOCATION:

PLUNETTI PARK
S. 21ST STREET & PACIFIC AVENUE
TACOMA, WASHINGTON

DATE: June 14, 2001

SUBSURFACE MAPPING SURVEY

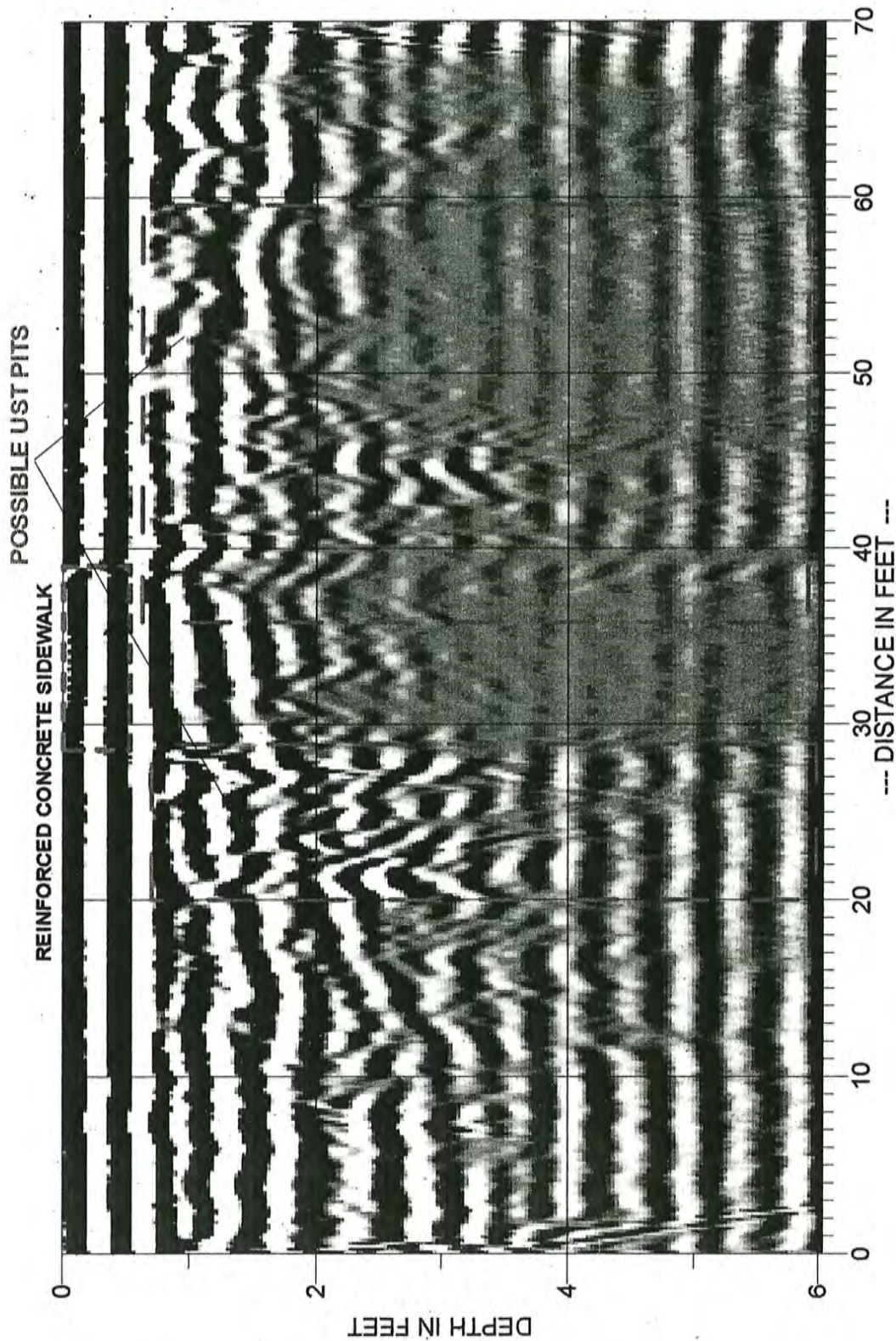
PROJECT NO. 3818

CLIENT:

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Figure 3

GPR PROFILE P0



 ENVIRONMENTAL & EXPLORATION GEOPHYSICS 437 ALE LIBERTY AVE. GRESHAM, OR 97030 • PH (503) 865-7329 • FAX (503) 492-4404 E-MAIL: GeoPotential@aol.com		LOCATION: RUGNETTI PARK S 21ST STREET & PACIFIC AVENUE TACOMA, WASHINGTON	Figure 4 GPR PROFILE P5
DATE: June 14, 2001	PROJECT No. 3318 SUBSURFACE MAPPING SURVEY	CLIENT: WASHINGTON STATE DEPARTMENT OF ECOLOGY	

APPENDIX

MAGNETOMETER SURVEYS

The earth's magnetic field, measured in "nano Tesla's" (nT), behaves like a bar magnet, with the strongest magnetic field located at the poles, and the weakest field located near the equator. In the United States, the average field intensity varies widely, however, the average value is about 50,000 nT. Also, like the magnetic field around the bar magnet, the earth's magnetic field is inclined. This inclination varies between 60 and 75 degrees, generally depending upon the latitude of the measuring location. The earth's magnetic field varies constantly and, during sunspot activity, quite dramatically. A magnetometer is an electronic device that measures the intensity of the earth's magnetic field.

Naturally occurring geologic features and buried ferrous metal objects such as underground storage tanks, drums, ordnance, pipes and debris filled trenches produce both horizontal and vertical disturbances to the earth's local magnetic field. The objects causing these "anomalies" can be detected quickly and reliably using portable magnetometers.

The intensity of an anomaly is a function of the mass, size and depth of burial of the object. As a rule of thumb, single drums buried several feet below the surface produce anomalies of about 200 nT relative to the normal undisturbed background and can be detected at a horizontal distance of about 15 feet, while large caches of drums can produce anomalies of many thousands of nT and may be detectable 50 feet away.

Magnetometers generally measure horizontal variations in the local magnetic field. A magnetic gradiometer is a variant of the magnetometer that measures both the horizontal and the vertical magnetic field at each survey point. It consists of two identical sensors located vertically on a staff and having a fixed separation. The intensity of the magnetic field caused by a buried metal object varies inversely with the distance between the object and the sensor. The relative intensities measured simultaneously at each sensor are used to determine the relative depth of burial of an object.

Magnetic surveys can only detect ferrous metal objects and cannot be used to identify the buried object. Estimates of the total mass of a buried object are difficult due to the physical properties of the object and other factors. Interference caused by observed surface metal objects limits the accuracy of the survey. The anomalies produced by fences, power lines, cars and buildings can easily mask the anomaly caused by an underground target. It is a waste of time and money to conduct a mag survey in a wrecked car lot in order to locate even a massive cache of buried steel drums!

Magnetic surveys are cost effective. Using the standard "step and wait" magnetometer, data from approximately 1000 points can be obtained in one field day corresponding to between 1 acre and about 5 acres depending on site conditions and survey goals. More modern cesium magnetometers collect up to 10 readings per second continuously, thus the operator can proceed without stopping. Many modern magnetometers use an audible signal to call attention to anomalous data as it is obtained. At some sites metallic objects can be detected and marked in the field at the time of the survey.

The use of a second, automatically recording "base station" magnetometer is highly recommended due to temporal variations in the earth's magnetic field which must be removed from the field data before an accurate interpretation can be made.

Magnetic data are most commonly presented in two contour maps. The total magnetic field contour map shows the horizontal magnetic field and, therefore, the areal extent of anomalies. The gradiometer contour maps show the vertical magnetic field and indicate the relative depth of burial of the objects causing those anomalies.

GROUND PENETRATING RADAR SURVEYS

Ground Penetrating Radar (GPR) uses high frequency radio waves directed into the ground to acquire information about the subsurface. The energy radiated into the ground is reflected back to the antenna by features having significantly different electrical properties to that of the surrounding material. The greater the contrast, the stronger the reflection. Typical reflectors include water table, bedrock, bedding, fractures, voids, contaminant plumes and man-made objects such as UST's and utilities. Real-time data are printed on paper records and may also be displayed on a color monitor. Field data may be digitally recorded for later playback, processing and color plotting.

GPR can be a valuable tool to accurately locate both metallic and non-metallic UST's and utilities; buried drums and hazardous material even below reinforced concrete floors and slabs. GPR can delineate trenches and excavations and, under some conditions, it can be used to locate contaminant plumes. It has been used as an archaeological tool to look for buried artifacts. It can accurately profile fresh water lake bottoms either from a boat or from a frozen lake surface. GPR can locate voids below roads and runways. GPR has numerous engineering applications. It can be used in non-destructive testing of engineering material, for example, locating rebar in concrete structures and determining the thickness of concrete and other structural material.

ADVANTAGES

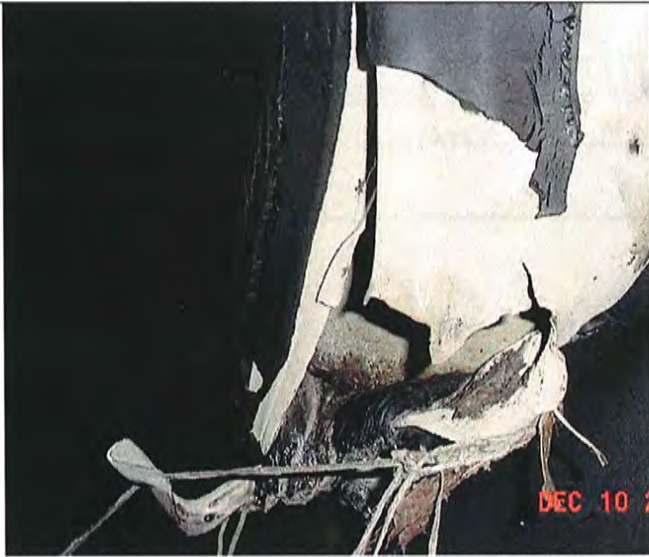
- . GPR provides continuous records along traverses which, depending on the goal of the survey, may be interpreted in the field.
- . In clean, dry, sandy soil, reflections from targets as deep as 100 feet are possible.
- . At flat, open sites, for reconnaissance purposes, the antenna can be towed behind a vehicle at several mph.
- . Many GPR antennas are shielded and are unaffected by surface and overhead objects and power lines.
- . The resolution of data is very high particularly for high frequency antennas.
- . GPR can be used in conjunction with magnetic or EM surveys to accurately locate buried objects.
- . Under adverse site conditions, shallow, man-made objects generally can be detected.
- . Fiberglass UST's can be detected using GPR.

LIMITATIONS

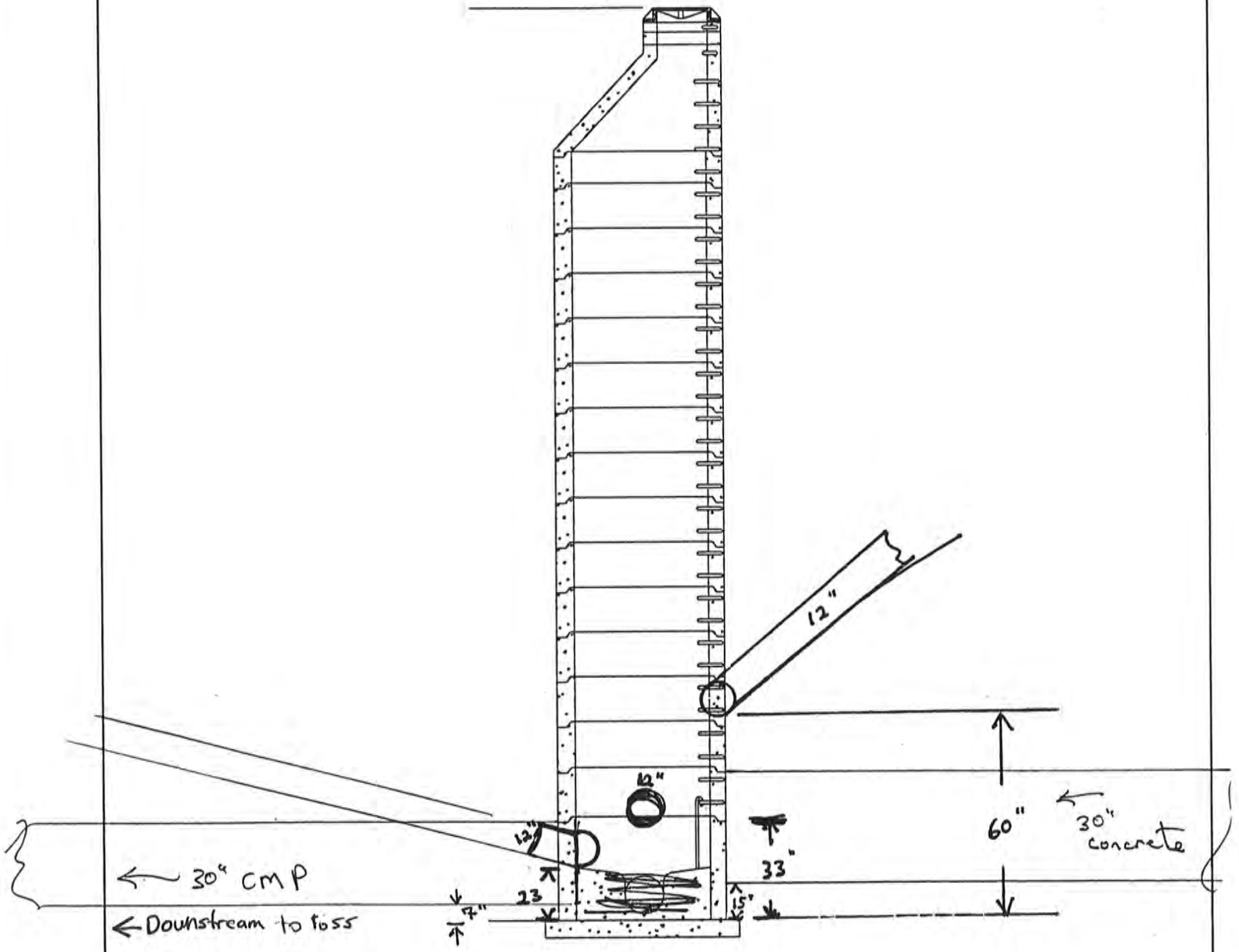
- . Penetration of the GPR signal is "site specific" and its depth of penetration at a particular site cannot be predicted ahead of time. Near surface conductive material, such as salty or contaminated ground water and wet, clay-rich soil, may attenuate the radar signal, limiting the effective depth of the survey to several feet.
- . Adequate contrast between the ground and the target is required to obtain reflections. UST's may be missed if they are badly corroded.
- . To determine the depth to an object without "ground truth", assumptions must be made regarding soil properties.
- . GPR may not be cost-effective for some projects. For a detailed survey mapping underground storage tanks and utilities, it may be necessary to collect data in orthogonal directions at 5-foot line spacing.
- . To acquire the highest quality data, proper coupling between the antenna and the ground surface is necessary. Poor data may be obtained at sites covered with tall grass and brush.

APPENDIX C





B



CITY OF TACOMA
DEPARTMENT OF PUBLIC WORKS

MH #447 REPAIR
FUGNETTI PARK
S. 21st AND PACIFIC AVE.

DATE
FEB 12, 02

DES

DR
SHK

CK

SCALE
N.T.S.

SHEET 3 of 4

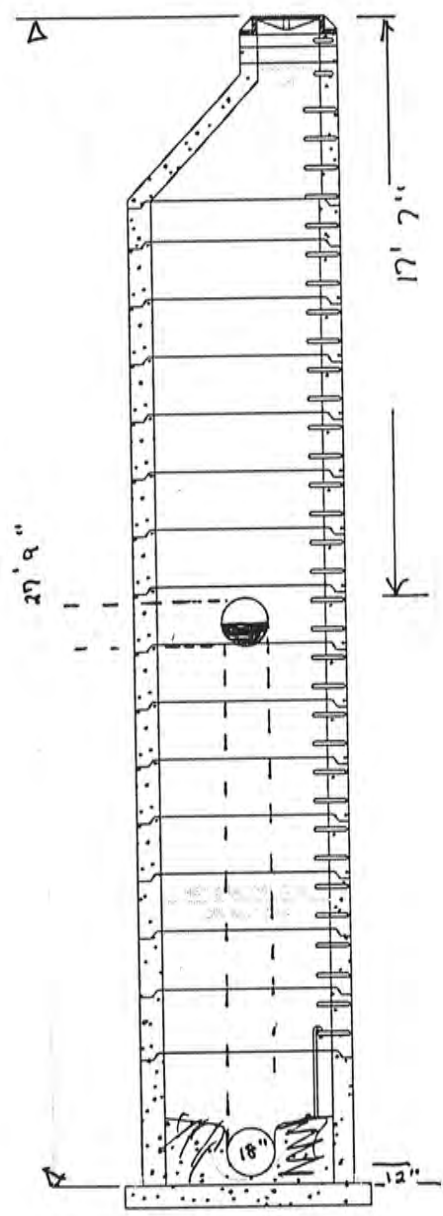
MH447-repair.dwg
DWS NAME

A

3/23/02

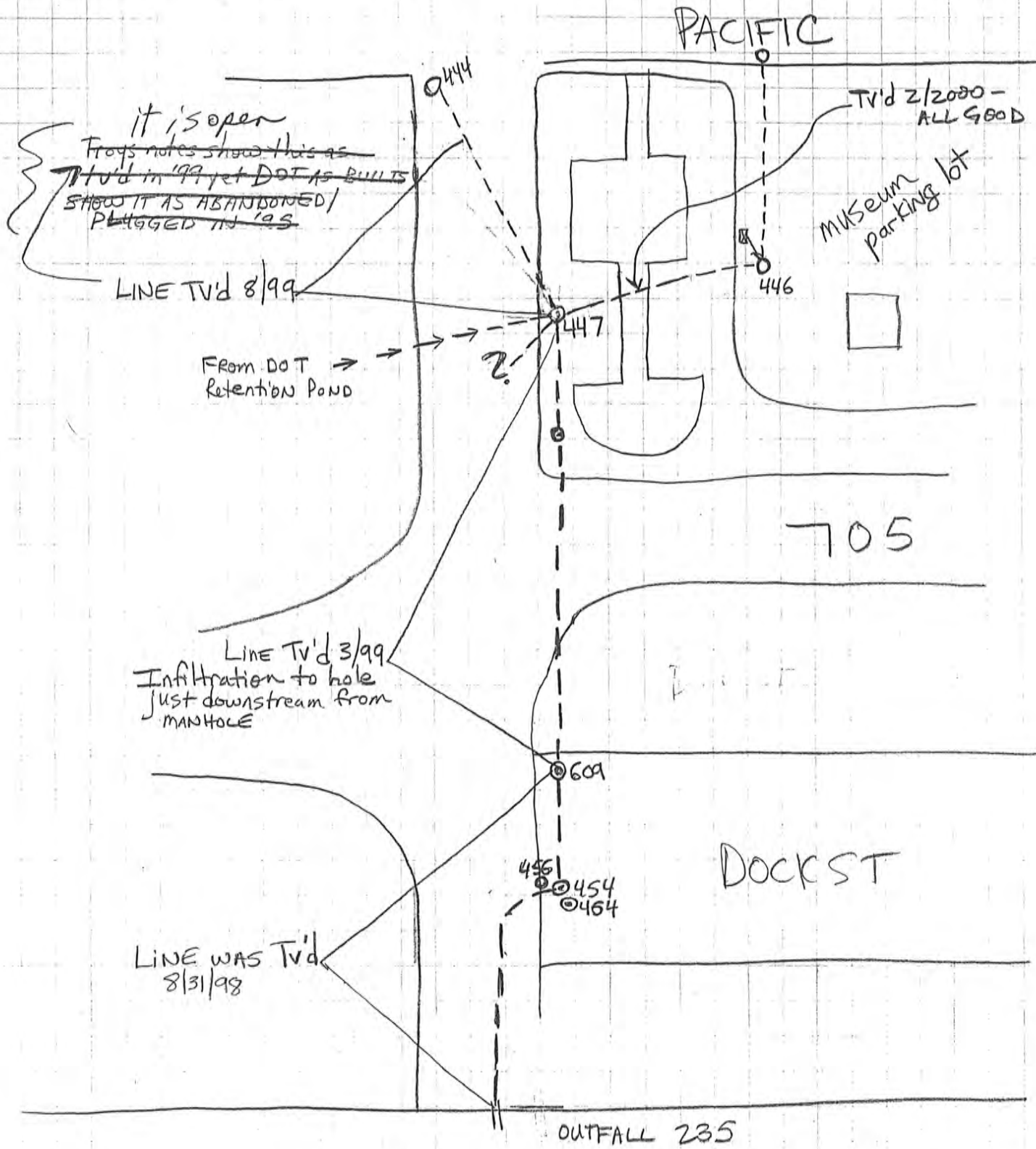
Joyce,

Drawings &
Measurements
per your
request -
these will be
formalized as
time permits
Jim O.



DRAFT

CITY OF TACOMA DEPARTMENT OF PUBLIC WORKS		
MH #447 REPAIR PUGNETTI PARK S. 21st AND PACIFIC AVE.		
DATE FEB 12, 02		SCALE N.T.S.
DES		
DR SHK		SHEET 3 OF 4
CK		MH447-repair.dwg DWG NAME



THEA FOSS

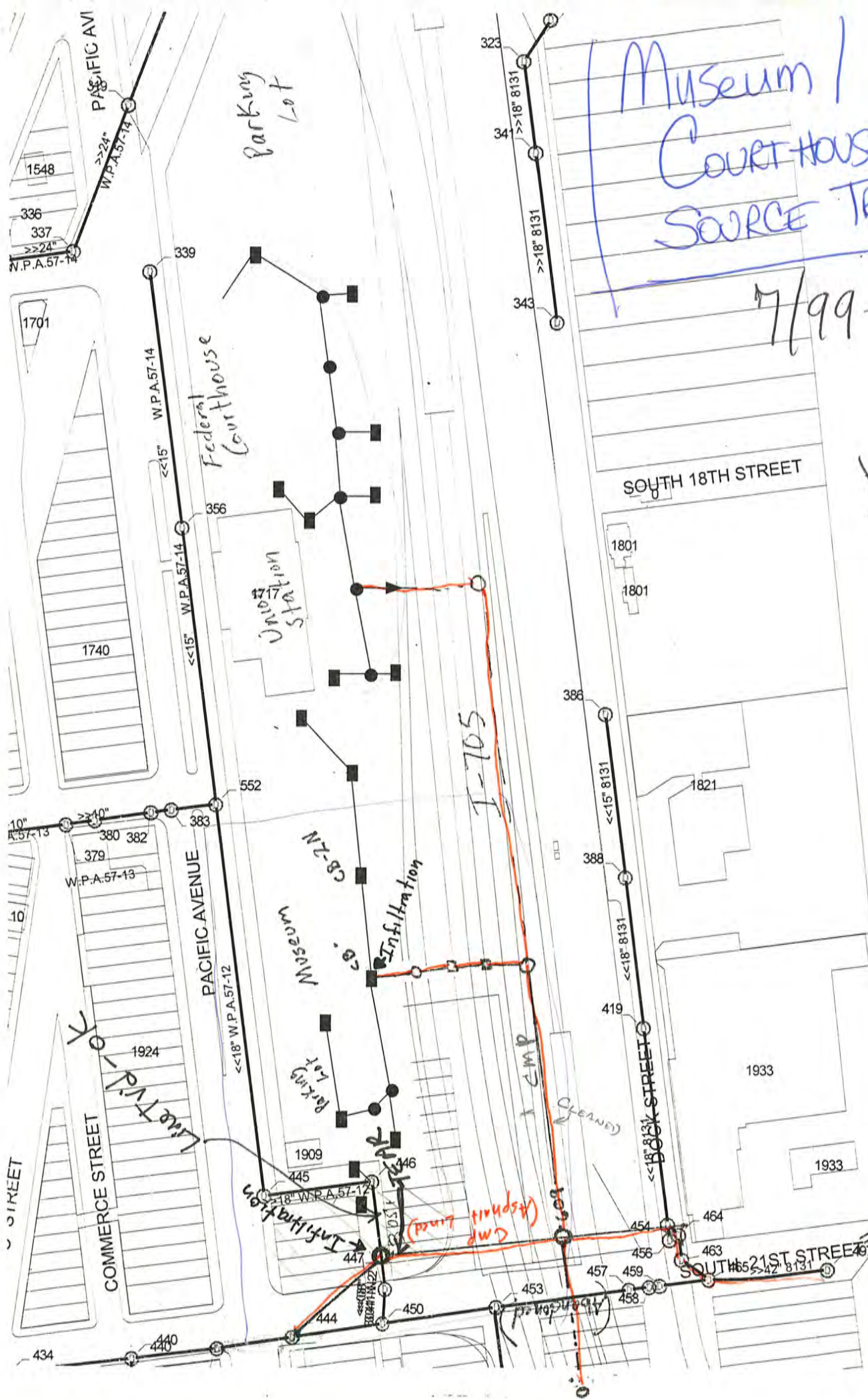
MUSEUM / COURT HOUSE SOURCE TRACING

7/99 keep this packet together

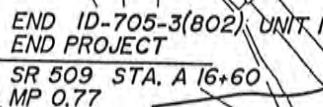
lines owned by DOT
DOT cleaned out

Then Foss Watway

PUBLIC PLACE



CITY OF TACOMA



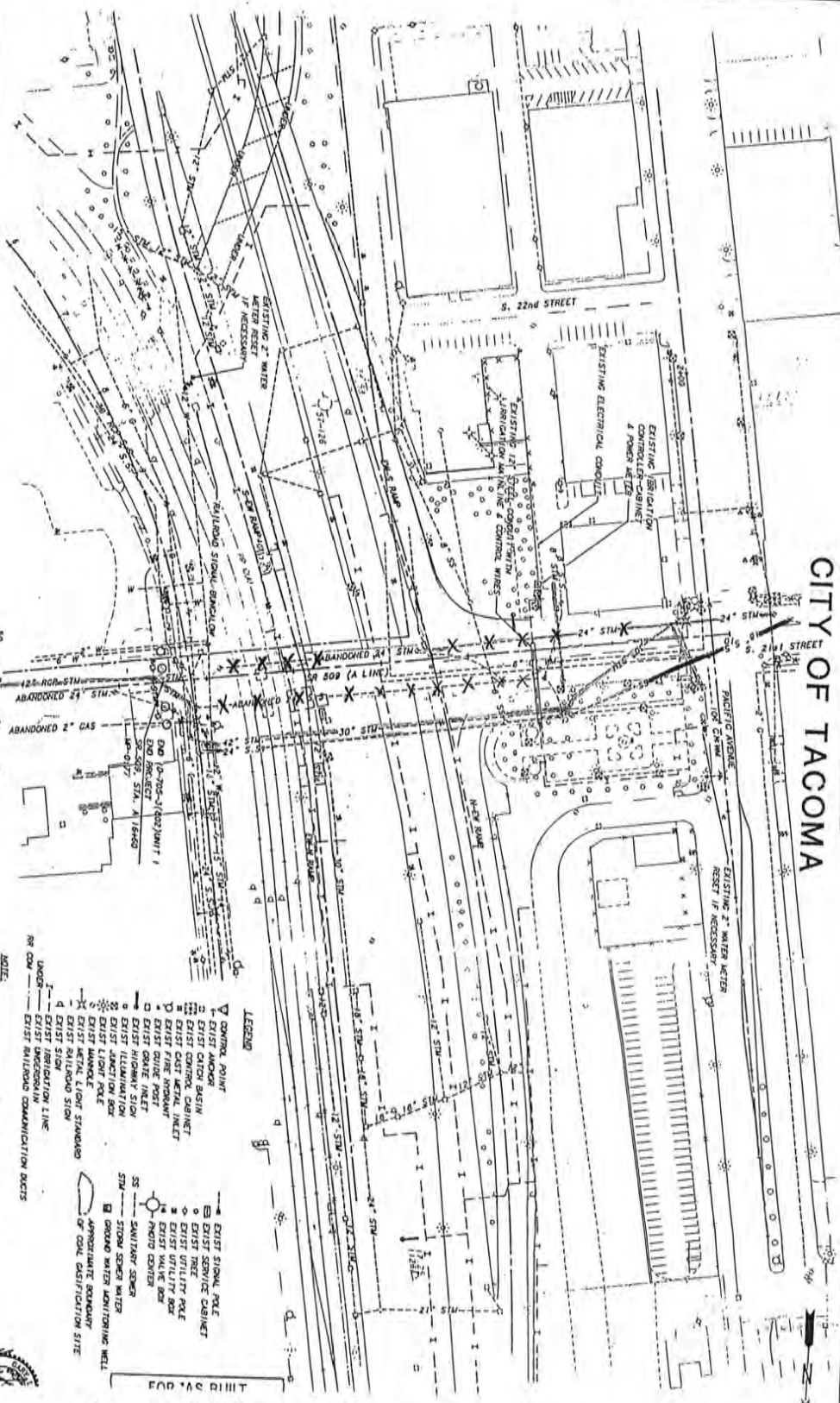
TO
PORTLAND
163 MILES

HIGHWAY DIVISION

PUGNETTI AREA AS-BUILTS

SEC. 4 T. 20N. R. 3E., W.M.

CITY OF TACOMA



DESIGNED	DATE	BY
RECORDED	DATE	BY
CHECKED	DATE	BY
DATE	BY	

REVISION	DATE	BY
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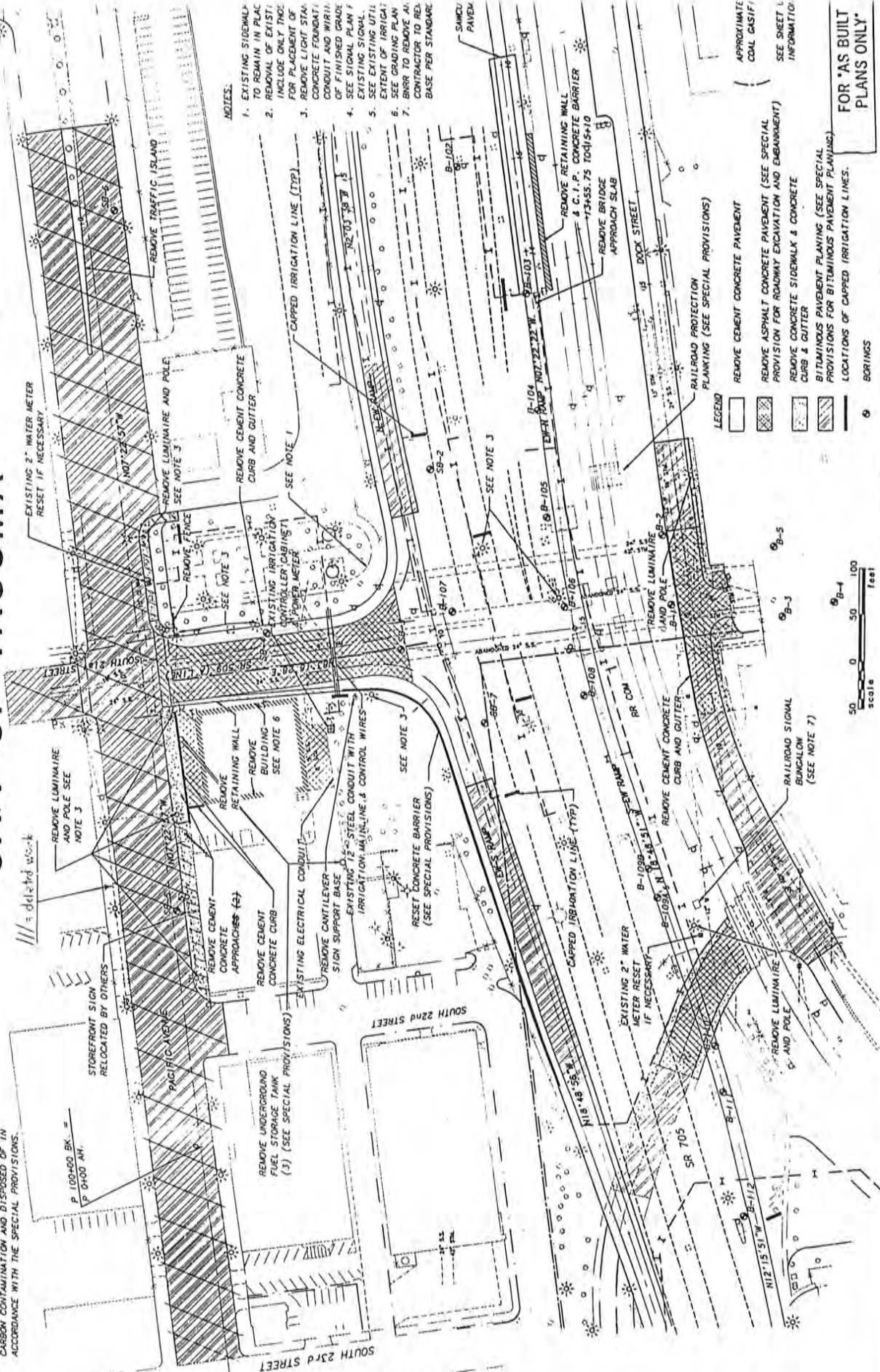
Washington State
Department of Transportation
CONTRACT NO. 100-100-0000
A portion of the project shown

SR 509
PACIFIC AVENUE TO
DOCK STREET
EXISTING UTILITIES

AS-BUILT PLANS from
Microfilm a) DOT Eng Records

SEC. 4 T. 20N. R. 3E., W.M.

NOTE: MATERIAL REMOVED DURING FOOTING EXCAVATION WILL BE TESTED FOR HYDROCARBON CONTAMINATION AND DISPOSED OF IN ACCORDANCE WITH THE SPECIAL PROVISIONS.



- NOTES:**
1. EXISTING SUDOWALL TO REMAIN IN PLACE
 2. REMOVAL OF EXISTING CONCRETE FOUNDATION TO INCLUDE ONLY THOSE FOR PLACEMENT OF CONCRETE FOUNDATION
 3. REMOVE LIGHT STAMPS FROM EXISTING CONCRETE FOUNDATION AND REINFORCEMENT
 4. SEE SIGNAL PLAN F FOR EXISTING SIGNAL
 5. EXTENT OF IRRIGATION TO REMAIN
 6. SEE GRADING PLAN FOR EXISTING GRADING
 7. BNR TO REMOVE AN EXISTING BASE FOR STAMPER

APPROXIMATE
COAL GASIFI-
SEE SHEET L
INFORMATION:

REMOVE ASPHALT CONCRETE PAVEMENT (SEE SPECIAL PROVISION FOR ROADWAY EXCAVATION AND EMBANKMENT)

REMOVE CONCRETE SIDEWALK & CONCRETE CURB & GUTTER

BITUMINOUS PAVEMENT PLACING (SEE SPECIAL PROVISIONS FOR BITUMINOUS PAVEMENT PLACING)

FOR "AS BUILT"
PLANS ONLY.

SEE SHEET UI FOR EXISTING UTILITIES LEGEND

Washington State
Department of Transportation

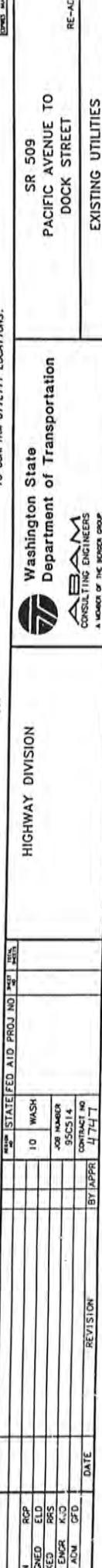
ABAM
CONSULTING ENGINEERS
A MEMBER OF THE BERGER GROUP

SITE PREPARATION AND DEMOLIT

[illegible]

PACIFIC AVENUE TO DOCK STREET

CITY OF TACOMA



State of Transportation	SR 509 PACIFIC AVENUE TO DOCK STREET EXISTING UTILITIES	RE-AC
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APPENDIX D



October 31, 2006¹

MEMORANDUM

TO: Pugnetti Park File

FROM: Joyce Mercuri, TCP SWRO Site Manager

SUBJECT: Upstream and Downstream Storm Drain Survey

Ecology staff Joyce Mercuri and Marv Coleman, City of Tacoma stormwater source control staff Jim Oberlander, and city utilities crews, inspected manholes upstream and downstream of Pugnetti Park on the evening of June 2 to observe drains for odors or visual signs of petroleum contamination, and to obtain samples of dry-weather storm drain flows. Dry weather flows are thought to be representative of groundwater infiltrating into the storm drain lines. Samples were obtained from manholes as listed below. The purpose of the investigation was threefold:

- 1) To determine whether there could be an upgradient source of gasoline contamination traveling along the storm drain bedding to where it was observed entering a hole in the storm line pipe near Pugnetti Park, just downstream of City of Tacoma manhole # 447. It was assumed if such a source were present there may be signs of it in the upgradient storm system. Also, it is believed that underground storage tanks existed at the old Heidelberg Brewery building to the west of Pugnetti Park, and also at a site across the street from the brewery.
- 2) To observe storm manhole #447 adjacent to the park and the next downgradient manhole (#609 – just east of I-705) to determine whether any gasoline is currently entering the system from the contamination at the park.
- 3) To obtain samples of water infiltrating into the storm lines to evaluate other potential sources of pollution in this drainage system.

A followup survey of the drainage system behind the Washington State History Museum was conducted later in the week, to attempt to identify the source of an odor that has been noted throughout that area on several occasions.

¹ This memo was originally drafted shortly after the sampling event, in August 12, 2003 but not finalized at that time.

The survey was conducted between 7 p.m and 11:30 p.m. to avoid traffic. Water was observed flowing in some of the drains. The day of the survey was very warm, and Jim Oberlander noted the flow could be contributed to by cooling water (air conditioner condensate) discharged from nearby buildings.

Observations and Samples (Manholes are described west to east along 21st Avenue):
Refer to Table 1 for a summary of sample results.

MH 6767375 (formerly MH430): Southwest corner of Hood Street and 21st Street, at the northeast corner of the warehouse building located on that corner. Small amount of baseflow coming from the west (uphill along 21st Street). This manhole receives flow from storm drains west on 21st Street and north on Market Street. No petroleum odors or sheen. Sampled – VOA, NWTPH-Gx. Gasoline not detected. Chlorinated solvents detected.

MH 6767384 (formerly MH 434): Center of C Street on south side of 21st Street, near the former Heidelberg brewery building and downstream from 430. This manhole receives flow from a short system to the south on “C” Street and from uphill on 21st Street. Baseflow was not present in the system coming from C Street. The main east-west line contained same base flow as 430. This is downhill from possible former fueling facility at the north end of Heidelberg building. No petroleum odor or sheen was noted. Not sampled.

MH 6752164 (formerly MH 038): Directly south and upstream of MH 6767384 in C Street, across from main door of old Heidelberg building. This was observed because potential heating oil tank in this vicinity. No baseflow, odor, or sheen was noted. Not sampled.

MH 6767411 (formerly MH 442): At the southwest corner of Pacific Avenue and 21st Street northeast of the Loft building. This contained the same baseflow as previous two upstream manholes (6767375 and 6767384). No odor or sheen was noted. Sampled – VOA, NWTPH-Gx. Chlorinated solvents detected.

MH 6767450 (formerly 447): In north side right of way of 21st Street, in the ivy just south of the fence at Pugnetti Park. This is a deep manhole (27”) and was entered by Jim Oberlander using confined space entry procedures. This is the manhole where the hole in the corrugated metal drain pipe was repaired by the City of Tacoma to stem the inflow of gasoline-contaminated groundwater from Pugnetti Park. This receives flow from the upstream system on 21st Street described above, and also from north on Pacific Avenue in the vicinity of the History Museum and University of Washington. The upstream line from the north crosses Pugnetti Park after a junction with manhole 6767441 (formerly MH 446). (6767441 was sampled by Ecology in March, 2002. Chlorinated solvents and gasoline constituents were detected. The results are included in this memo).

Base flow was observed in both the line coming from north on Pacific Avenue (via MH 6767441), and the line coming from the west on 21st Street as noted in the other upstream manholes. We dubbed these two drainages MH447N and MH447W for the purposes of sampling. MH 447W contained the higher flow – similar to that noted in the other upstream drains to the west. A smaller amount of flow was observed to be coming from 447N. A slight

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odor as described below was present. No sheen was present. MH447N and 447W were sampled – VOA, NWTPH-Gx, HCID. Chlorinated solvents and toluene were detected.

MH 6767707 (formerly MH 609): This manhole is located downstream from Pugnetti Park and is the next manhole downstream from 6767450. It is located under the 21st Street/I-509 westward bridge approach. Three tributaries were noted entering here, named by the inspectors as follows: 609W from the west (Pugnetti Park), 609N from the north (I-705 drainage due east of the History Museum), and 609S (line not shown on City of Tacoma stormwater system maps). The City does not have as-builts showing the drainage system for I-705, so it is not clear how the north or south systems are configured. Base flow was present from the west (as described for all drains in 21st Street above), and also from the north tributary. There was a strong odor. No sheen was noted, although by this time it was 11:00 p.m. and it was difficult to be certain in the dark. 609W and 609N sampled – VOA, NWTPH-Gx, HCID. Chlorinated solvents were detected, as was benzene in the line coming from Pugnetti Park.

Odors

On several occasions an odor has been noted emanating from manholes and catch basins near Pugnetti Park and behind the Washington State History Museum. This same odor was smelled in the catch basins on edge of the northbound lanes of I-705 during a field visit with WSDOT in May, and also quite strongly within MH 609 on this sampling occasion. It is a petroleum odor – possibly heavily weathered heavy oil, but not as much like the high volatile odor of benzene or gasoline. There is a slight edge of sulfur and possibly a creosote odor associated with it.

Behind History Museum

On June 4, Joyce Mercuri, Marv Coleman, and Jim Oberlander did a followup survey of the drainage system behind the History Museum to attempt to identify the source of the odors noted throughout this area. When the museum was built in the early 1990's, underground tanks were removed from the north and south ends of the site. A sketch of the drains is attached to this memo. The manhole at the north end of the parking lot is a deep sump with two smaller incoming pipes from the north, which contained a very small flow. No odors were noted. The middle manhole had a slight odor, and the southerly manhole did not have an odor.

Conclusions

Volatile organics: All drains contain evidence of chlorinated solvent contamination. The highest level detected was 17 parts per billion (ppb) in the farthest upstream manhole tested on 21st Street (MH 6767375/formerly 430). The original source of these solvents is not known, but there are two known trichloroethylene plumes between 18th and 21st Streets, in the vicinity of the University of Washington Campus. There is also a tetrachloroethylene plume that straddles Pacific Avenue north of Pugnetti Park approximately even with the federal courthouse building (former Union Station). These plumes may be impacting the storm drain lines through infiltration of contaminated groundwater. The source of the TCE plumes is currently being investigated under an interagency agreement between Ecology and the University of Washington.

Hydrocarbons: Gasoline was not detected in any of the manholes. MH 6767375/430, upstream of Pugnetti Park contained low levels of toluene. Manhole 6767441/446, located in the path of the

groundwater flow from Pugnetti Park, contains low levels of ethylbenze and xylenes which are associated with gasoline. MH 6767450/447N, which comes from a line crossing Pugnetti Park, contained a small amount of toluene, but not other chemicals associated with gasoline. MH 6767707, samples 609W and 609N (which had the strongest odor) contained Isopropylbenzene(cumene), n-Propylbenzene, and sec-Butylbenzene, all which could be associated with gasoline or diesel (although these samples did not contain any BTEX components).

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TABLE 1: Detected Analytes, Pugnetti Drain Survey

Manhole ID	6767375	6767411	6767441	6767450	6767450	6767707	6767707
Former Manhole ID	MH 430	MH 442	MH 446	MH447W	MH447N	MH 609W	MW609N
Lab Sample ID	03234020	03234023	02138050	03234020	03234021	03234025	03234024
Date sampled	6/2/03	6/2/03	3/28/02	6/2/03	6/2/03	6/2/03	6/2/03
Cis-1,2-Di chloroethene (ug/l)	0.15J	1U	0.42J	1U	1U	1UJ	.20J
Chloroform (ug/l)	0.11J	1U	1U	.13J	.10J	1U	1U
Trichloroethene (ug/l)	17	7.8	0.36J	.25J	7.3	3.8	.31J
Tetrachloroethene (ug/l)	0.23J	1U	3.3	2.8	1U	.51J	1U
Dibromochloromethane (ug/l)	2U	2U	1U	.21NJ	2U	1U	2U
Benzene (ug/l)	1U	1U	1U	1U	1U	0.38J	1U
Ethylbenzene (ug/l)	1U	1U	4	1U	1U	1U	1U
M & p-xylene (ug/l)	2U	2U	11	2U	2U	2U	2U
o-xylene (ug/l)	1U	1U	2.7	1U	1U	1U	1U
Toluene (ug/l)	0.34J	1U	1U	1U	.10J	1U	1U
NWTPH-Gx (mg/l)	0.14U	0.14U	Not tested	0.14U	0.14U	0.14U	0.14U
HCID	Not tested	Not tested	Not tested	No detectable	No detectable	**	**

** This sample contains a few very early eluting compounds but they do not represent a recognizable petroleum pattern.



PUGNETTI PARK UPSTREAM AND DOWNSTREAM DRAIN SURVEY 6/2/03

NORTH ↑



DRAINAGE AND ODORS – WASHINGTON STATE HISTORY MUSEUM AND DOWNSTREAM DRAINAGE

6/4/03

Oberlander, Jim

From: Oberlander, Jim
Sent: Thursday, July 17, 2003 3:01 PM
To: 'Mercuri, Joyce'; 'Warren, Bob'; Coleman, Marv; Deleon, Dana; Flint, Kris; Fuller, Richard; Henley, Mary; Lawrence, Lisa (CHB); Rose, Leslie (CHB); Stonick, Cynthia
Cc: 'Nolen, Connie'; 'mstoxic@u.washingotn.edu'
Subject: Evening Stormwater Sampling w WDOE, OF 235 Basin, 6-2-03

Evening stormwater sampling and MH inspections to avoid busy daytime traffic. Warm and dry weather period. Storm flows may be higher because of wet winter, groundwater, and possibly HAV systems running this hot day. Focus; areas along South 21st, U of W Tacoma, Pugnetti Park, old Heidelberg Brewery, Dock St., SR 705. Sampling for VOAs & HCID. WDOE to handle and run samples. (Oberlander, Mercuri, Coleman, Essmeier, Stafford) Many MH's opened and inspected. The following were sampled:

MH 447 Pugnetti Park, west and north legs, sampled by entry (JO)

Contracted sealing work done by city, May '02, has held well, no I & I, "perfect"

MH 430 South 21st above old brewery RR Tracks, sampled w bailer. Old underground fuel tanks remain at closed brewery, both C Street and RR side.

MH 442 South 21st and Pacific. Sampled by bailer.

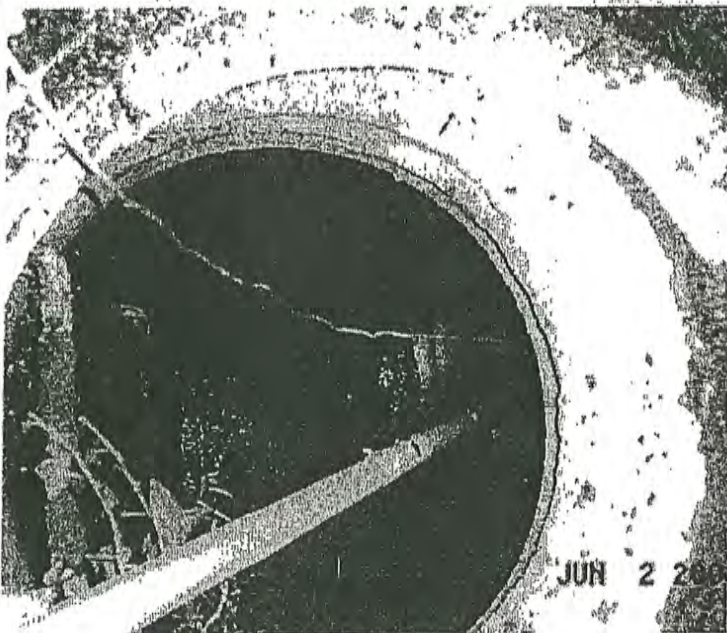
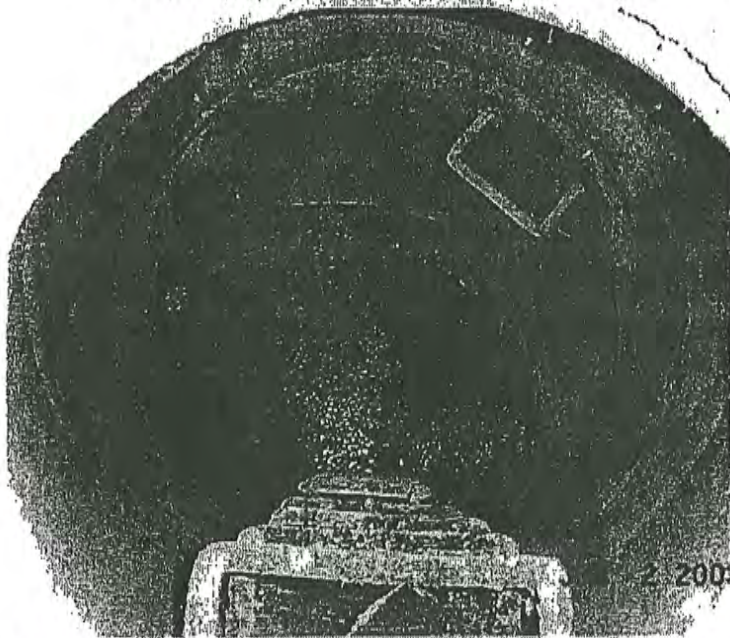
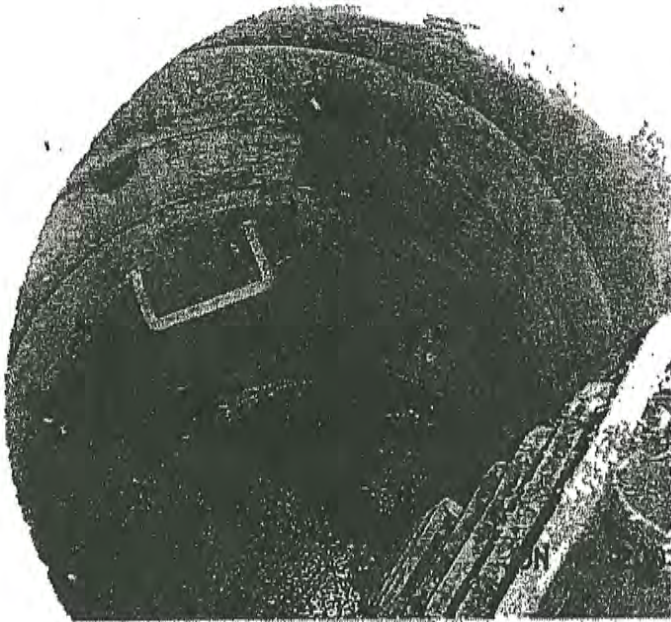
MH 609 SR 705 Sampled, west and north leg (our mapping doesn't reflect the approx. 20 inch CMP line from the north, no WSDOT mapping available) sampling by bailer, a little difficult, manhole top ring is offset. Better sample if an MH entry is made. (Later inspected by entry on June 24th, JO & RF).

Detailed notes taken by Joyce. Sampling and MH's inspected marked on project map. Photos also taken at each sampled MH. Photo sheet is available.

Jim Oberlander
City of Tacoma Environmental Services
Surface Water Management
2201 Portland Avenue, Tacoma 98421
(253) 502-2131

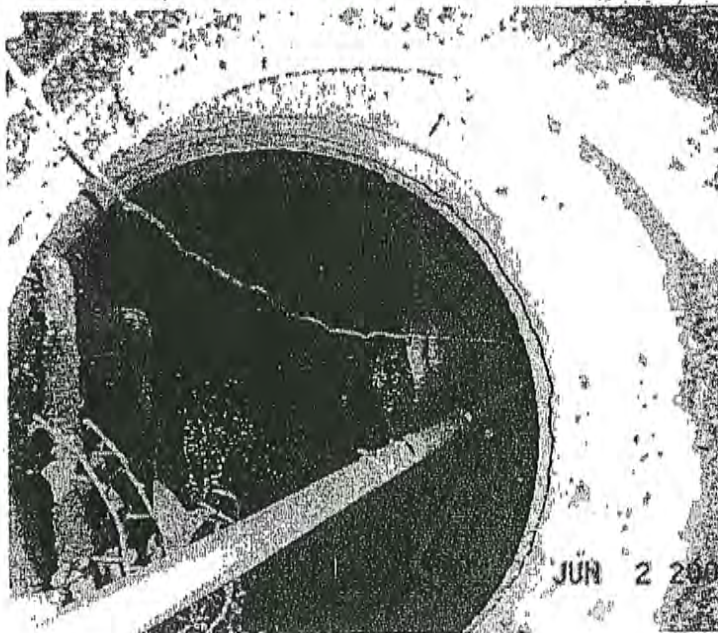
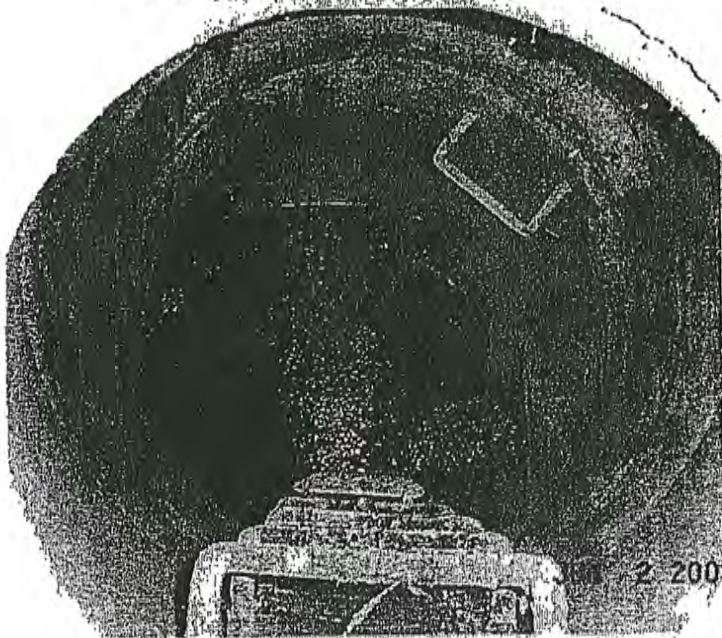
MH 609, along SR 705,

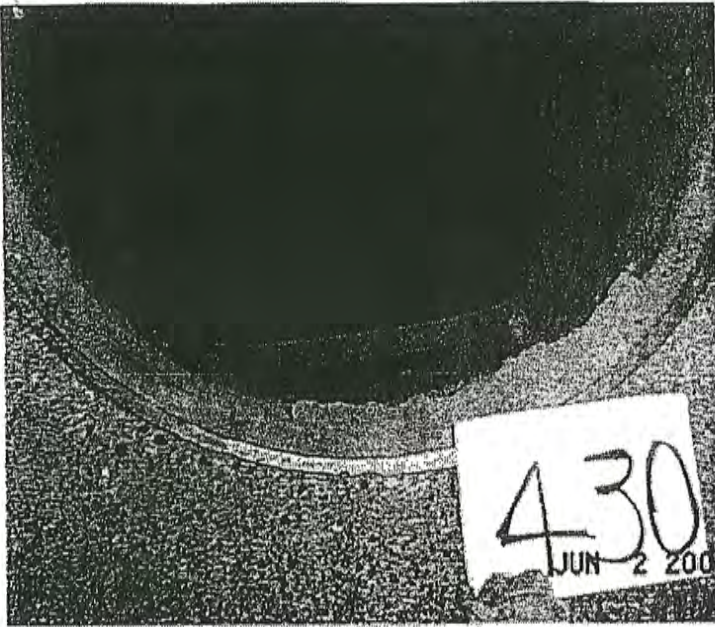
Jim Oberlander



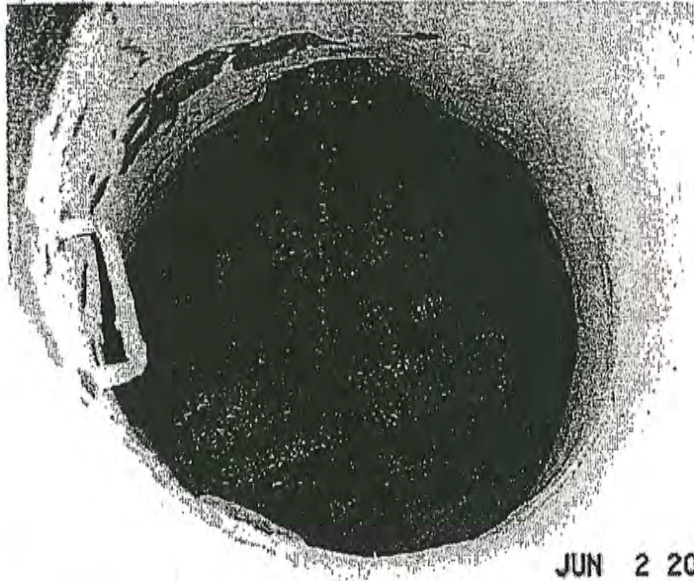
MH 609, along SR 705,

Jim Oberlander

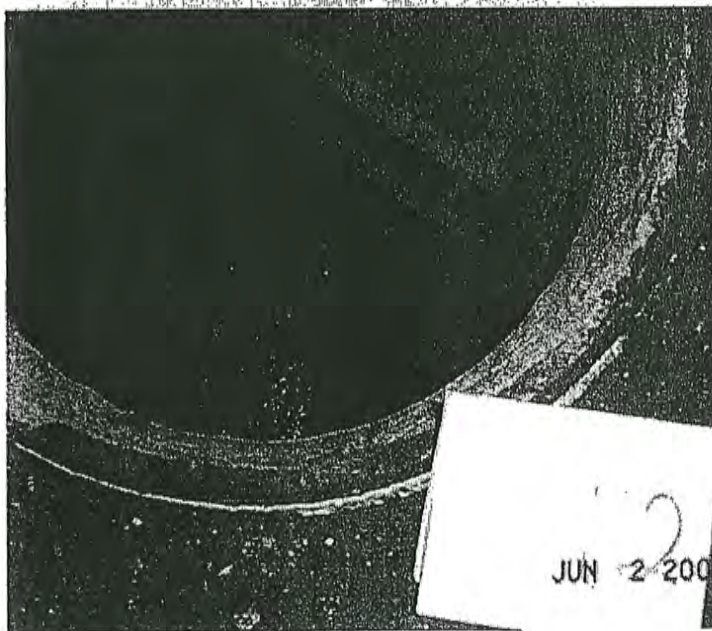




MH 430, 21st
Jim Oberlander



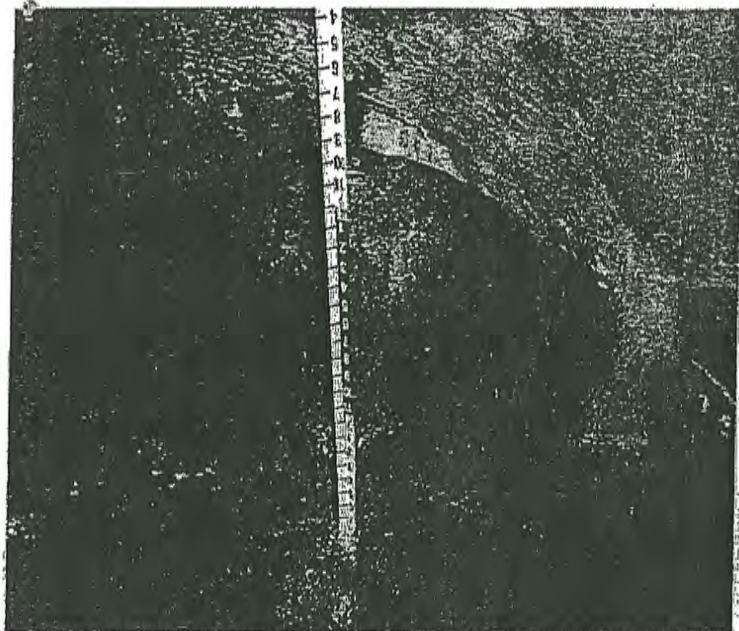
MH 430, 21st, Old line



MH 442, New MH and line in this area

Pugnetti Park MH 447, North

Jim Oberlander



Sampling w
WDOE
6/2/03 evening

OF-230

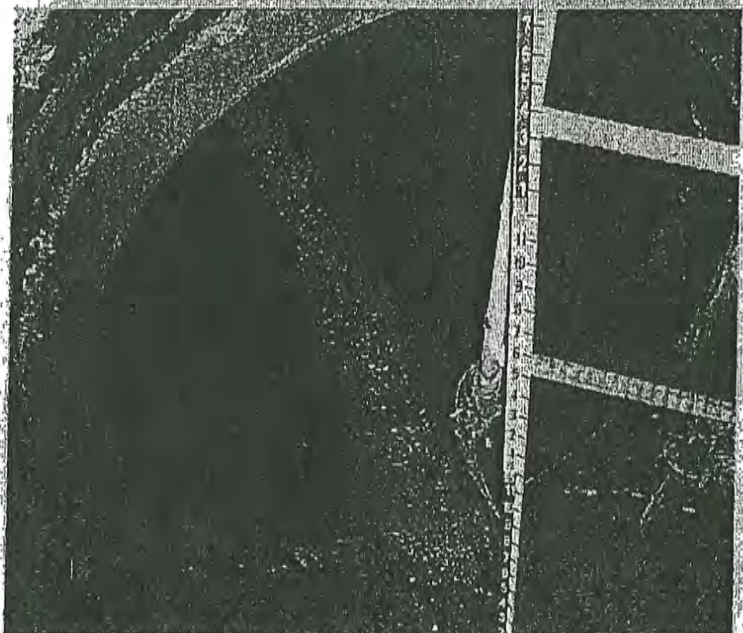
Drainage Basin

East



Samples for
VOA &
HClD

West/SW



Pugnetti Park MH 447, North

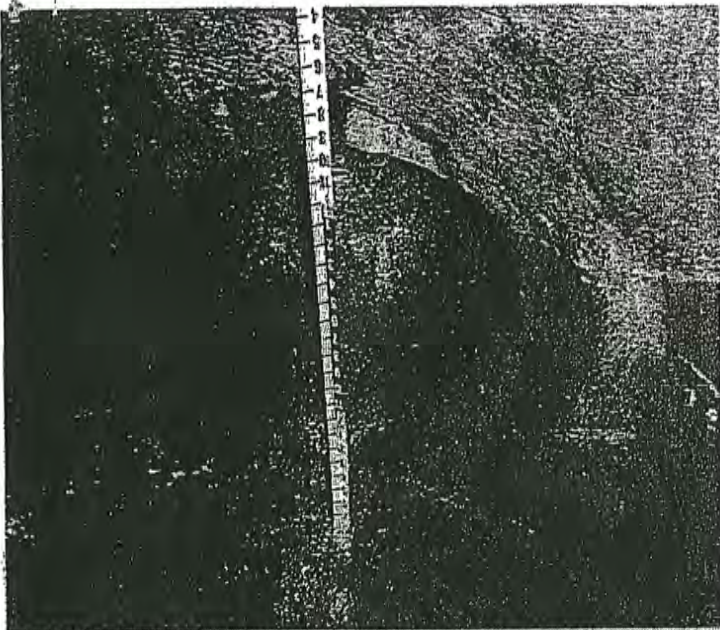
Jim Oberlander

Sampling w
WDOE
6/2/03 evening

OF-230

Drainage Basin

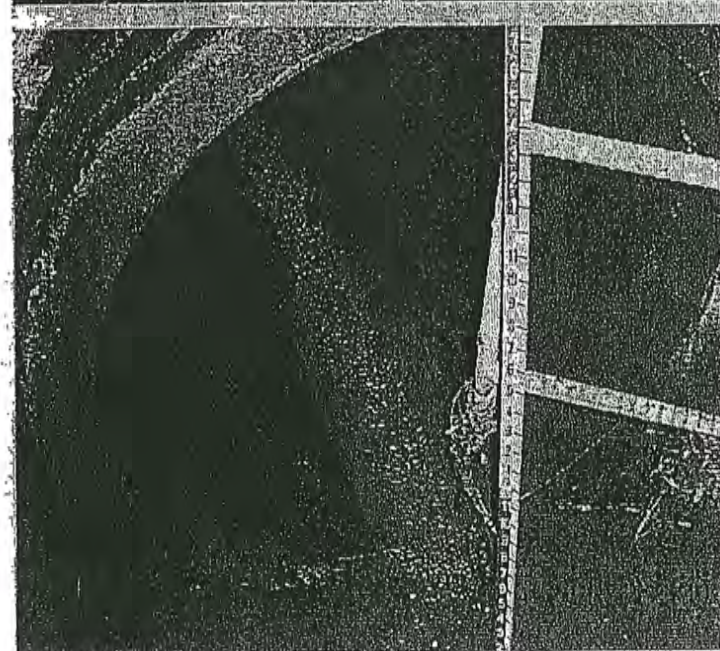
Samples for
VOA &
HClD



East



West/SW



Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366

RECEIVED
DEPT. OF ECOLOGY/SWRO

'03 JUN 16 A10:16

Case Narrative

June 5, 2003

Subject: Pugnetti Drain Survey Project

Sample(s): 03234020-25

Officer(s): Joyce Mercuri

By: Bob Carrell *BC*

NWTPH-Gx Analysis

Analytical Method

These water samples, a laboratory control sample and a method blank were analyzed by the NWTPH-Gx method which involves purging an aliquot of the sample, trapping the analytes then desorbing them to the inlet of a gas chromatograph (GC) where they are separated by the chromatographic column and determined by flame ionization detection (FID) for total gasoline.

Holding Times

All samples were prepared and analyzed within the method holding times.

Calibration

The initial eight point gasoline calibration used a linear fit which had a correlation coefficient of greater than 0.99 and no standard point varied from its true value by more than +/- 15%. The mid-range calibration check sample for target analytes was within +/- 15% of its true value both at the beginning of the analyses and at the end of the analytical run.

Blanks

No analytically significant levels of analyte were detected in the method blanks associated with these samples.

Surrogates

The surrogate recoveries were acceptable and within QC acceptance limits of 70% to 130%

Sample Duplicates

Insufficient sample.

Laboratory Control Samples

The results of the laboratory control sample were acceptable.

Comments

The data are useable as qualified.

Data Qualifier Codes

- | | | |
|-------------|---|---|
| U | - | The analyte was not detected at or above the reported result. |
| J | - | The analyte was positively identified. The associated numerical result is an estimate. |
| UJ | - | The analyte was not detected at or above the reported estimated result. |
| REJ | - | The data are unusable for all purposes. |
| NAF | - | Not analyzed for. |
| N | - | For organic analytes there is evidence the analyte is present in this sample. |
| NJ | - | There is evidence that the analyte is present. The associated numerical result is an estimate. |
| NC | - | Not Calculated |
| E | - | The concentration exceeds the known calibration range. |
| bold | - | The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.) |

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Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile petroleum products

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234020

Date Collected: 06/02/03

Method: NWTPH-GX

Field ID: 447W

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/04/03

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.14	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	95	%
Benzene, 1,4-dibromo-2-methyl-	96	%

Authorized By: Barrell

Release Date: 6-5-03

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile petroleum products

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234021

Date Collected: 06/02/03

Method: NWTPH-GX

Field ID: 447N

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/04/03

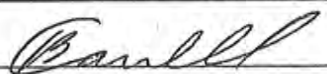
Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.14	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	95	%
Benzene, 1,4-dibromo-2-methyl-	96	%

Authorized By: 

Release Date: 6-5-03

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile petroleum products

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234021

Date Collected: 06/02/03

Method: NWTPH-GX

Field ID: 447N

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/04/03

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.14	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	95	%
Benzene, 1,4-dibromo-2-methyl-	96	%

Authorized By: Carroll

Release Date: 6-5-03

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile petroleum products

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234022

Date Collected: 06/02/03

Method: NWTPH-GX

Field ID: 430

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/04/03

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.14	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	95	%
Benzene, 1,4-dibromo-2-methyl-	94	%

Authorized By: _____

Canell

Release Date: _____

6-5-03

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile petroleum products

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234023

Date Collected: 06/02/03

Method: NWTPH-GX

Field ID: 442

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/04/03

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.14	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	96	%
Benzene, 1,4-dibromo-2-methyl-	92	%

Barrell

6-5-03

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile petroleum products

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234023

Date Collected: 06/02/03

Method: NWTPH-GX

Field ID: 442

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/04/03

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.14	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	96	%
Benzene, 1,4-dibromo-2-methyl-	92	%

Authorized By:

Paul

Release Date:

6-5-03

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile petroleum products

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234024

Date Collected: 06/02/03

Method: NWTPH-GX

Field ID: 609N

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/04/03

Units: mg/L

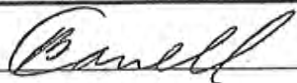
Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.14	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	95	%
Benzene, 1,4-dibromo-2-methyl-	89	%

Authorized By: _____



Release Date: _____

6-5-03

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile petroleum products

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234025

Date Collected: 06/02/03

Method: NWTPH-GX

Field ID: 609W

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/04/03

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.14	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	95	%
Benzene, 1,4-dibromo-2-methyl-	88	%

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile petroleum products

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234025

Date Collected: 06/02/03

Method: NWTPH-GX

Field ID: 609W

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/04/03

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.14	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	95	%
Benzene, 1,4-dibromo-2-methyl-	88	%

Authorized By: _____

Barrell

Release Date: _____

6-5-03

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile petroleum products

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Lab ID: OBF3155A1

Method: NWTPH-GX

QC Type: Laboratory Control Sample

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/04/03

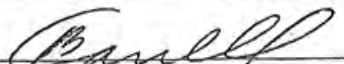
Units: %

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	109	
----------	-----	--

Surrogate Recoveries

1,4-Difluorobenzene	95	%
Benzene, 1,4-dibromo-2-methyl-	96	%

Authorized By: 

Release Date: 6-5-03

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile petroleum products

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Lab ID: OBWA155G

Method: NWTPH-GX

QC Type: Laboratory Method Blank

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/04/03

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.14	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	99	%
Benzene, 1,4-dibromo-2-methyl-	101	%

Authorized By: Barrell

Release Date: 6-5-03

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile petroleum products

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Lab ID: OBW3155G

Method: NWTPH-GX

QC Type: Laboratory Method Blank

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/04/03

Units: mg/L

Analyte	Result	Qualifier
---------	--------	-----------

Gasoline	0.14	U
----------	------	---

Surrogate Recoveries

1,4-Difluorobenzene	99	%
Benzene, 1,4-dibromo-2-methyl-	101	%

Authorized By: _____

Barrell

Release Date: _____

6-5-03

Page: 1

Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366

Case Narrative

June 18, 2003

Subject: Pugnetti Drain Survey

Samples: 03234020 through 03234025

Officer: Joyce Mercuri

By: John Weakland



Volatiles Analysis

Analytical Method

The water samples were analyzed by SW-846 8260 for volatile organic compounds.

Holding Times

All of the samples were analyzed within the method holding times.

Instrument Tuning

Calibration against bromofluorobenzene (BFB) is acceptable for the initial calibration, continuing calibration and all associated sample analyses.

Calibration

The initial calibrations were acceptable and within established QC limits with the following exceptions. The percent relative standard deviation for 1,2,4-trichlorobenzene and 1,2,3-trichlorobenzene exceeded established QC limits. Consequently, any detected result is qualified J, estimated value and any non detected result is qualified UJ, estimated reporting limit.

The June 7 continuing calibration verification (CCV) had responses for some of the analytes that were outside established QC limits. Some of the responses were high indicating a high bias. However, none of the analytes were present in the associated samples and therefore no qualification was necessary. The response for methyl-t-butyl ether was low indicating a low bias. Although none of the analytes were detected in the associated samples, the results are qualified UJ.

The June 12 continuing calibration verification (CCV) had responses for some of the analytes that were outside established QC limits. Some of the responses were high indicating a high bias. However, none of the analytes were present in the associated samples and therefore no qualification was necessary. The responses for 1,2,4-trichlorobenzene and 1,2,3-trichlorobenzene were low indicating a low bias. The analytes were qualified for other reasons and no further qualification of the data was necessary.

Blanks

There were no analytically significant analytes detected in any of the associated method blanks with the following exceptions.

The June 7 method blank contained acetone. If the amount of acetone present in the associated samples was less than the reporting limit and less than ten times the amount found in the method blank, it was reported not detected at the reporting limit without qualification. If the amount of acetone present in the associated samples was greater than the reporting limit but less than ten times the amount found in the method blank, it was reported not detected at the level detected and qualified UJ, estimated value.

The June 12 method blank contained acetone and naphthalene. If the amount present in the associated samples was less than the reporting limit and less than ten times the amount found in the method blank, it was reported not detected at the reporting limit without qualification. If the amount present in the associated samples was greater than the reporting limit but less than ten times the amount found in the method blank, it was reported not detected at the level detected and qualified UJ, estimated value.

Surrogates

The surrogate recoveries were reasonable, acceptable, and within established QC limits for all samples and associated QC samples with the following exceptions.

The percent recovery of 1,2-dichloroethane- d_4 was above established QC limits. This out of control event is attributed to internal standards being outside established QC limits and the affected analytes were qualified UJ, not detected at the estimated reporting limit.

Matrix Spikes

There was insufficient sample volume provided to analyze a matrix spike/matrix spike duplicate (MS/MSD).

Laboratory Control Samples (LCS)

The percent recoveries and the relative percent differences for LCS3157W and LCS3157X were within established QC limits with the following exceptions.

The June 12 continuing calibration verification (CCV) had responses for some of the analytes that were outside established QC limits. Some of the responses were high indicating a high bias. However, none of the analytes were present in the associated samples and therefore no qualification was necessary. The responses for 1,2,4-trichlorobenzene and 1,2,3-trichlorobenzene were low indicating a low bias. The analytes were qualified for other reasons and no further qualification of the data was necessary.

Blanks

There were no analytically significant analytes detected in any of the associated method blanks with the following exceptions.

The June 7 method blank contained acetone. If the amount of acetone present in the associated samples was less than the reporting limit and less than ten times the amount found in the method blank, it was reported not detected at the reporting limit without qualification. If the amount of acetone present in the associated samples was greater than the reporting limit but less than ten times the amount found in the method blank, it was reported not detected at the level detected and qualified UJ, estimated value.

The June 12 method blank contained acetone and naphthalene. If the amount present in the associated samples was less than the reporting limit and less than ten times the amount found in the method blank, it was reported not detected at the reporting limit without qualification. If the amount present in the associated samples was greater than the reporting limit but less than ten times the amount found in the method blank, it was reported not detected at the level detected and qualified UJ, estimated value.

Surrogates

The surrogate recoveries were reasonable, acceptable, and within established QC limits for all samples and associated QC samples with the following exceptions.

The percent recovery of 1,2-dichloroethane- d_4 was above established QC limits. This out of control event is attributed to internal standards being outside established QC limits and the affected analytes were qualified UJ, not detected at the estimated reporting limit.

Matrix Spikes

There was insufficient sample volume provided to analyze a matrix spike/matrix spike duplicate (MS/MSD).

Laboratory Control Samples (LCS)

The percent recoveries and the relative percent differences for LCS3157W and LCS3157X were within established QC limits with the following exceptions.

The percent recovery of some of the analytes exceeded established QC limits. Some of the analytes had recoveries above QC limits indicating a high bias. However, since none of the analytes were detected in the samples, no qualification of the data is necessary. The percent recoveries of methyl-t-butyl ether and 1,2,3-trichloropropane were below QC limits indicating a low bias. Although, none of the analytes were detected in the samples, the associated samples were qualified J, estimated value.

Comments

The response of the internal standard 1,2-dichlorobenzene- d_4 for some of the samples and method blank exceeded established QC limits. A subsequent reanalysis yielded similar results and the affected analytes are qualified UJ, not detected at the estimated reporting limit. None of the affected analytes in any of the associated samples were detected above the reporting limit.

Prior to the reanalysis of sample 03234025, the vial broke and the sample was lost. Consequently, in addition to the internal standard 1,2-dichlorobenzene- d_4 being outside of established limits, the internal standard fluorobenzene was below established QC limits. Although none of the affected analytes were detected in the sample, they were qualified UJ, not detected at the estimated reporting limit.

The data is usable as qualified.

Data Qualifier Codes

U	-	The analyte was not detected at or above the reported result.
J	-	The analyte was positively identified. The associated numerical result is an estimate.
UJ	-	The analyte was not detected at or above the reported estimated result.
REJ	-	The data are unusable for all purposes.
NAF	-	Not analyzed for.
N	-	For organic analytes there is evidence the analyte is present in this sample.
NJ	-	There is evidence that the analyte is present. The associated numerical result is an estimate.
NC	-	Not Calculated
E	-	The concentration exceeds the known calibration range.
bold	-	The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey			LIMS Project ID: 1528-03		
Sample: 03234020			Date Collected: 06/02/03		
Field ID: 447W			Method: SW8260		
Project Officer: Joyce Mercuri			Matrix: Water		
			Units: ug/L		
			Date Analyzed: 06/12/03		
Analyte	Result	Qualifier	Analyte	Result	Qualifier
Dichlorodifluoromethane	1	U	Dibromochloromethane	.21	NJ
Chloromethane	2	U	1,2-Dibromoethane (EDB)	1	U
Vinyl Chloride	2	U	Chlorobenzene	1	U
Bromomethane	1	U	1,1,1,2-Tetrachloroethane	1	U
Chloroethane	2	U	Ethylbenzene	1	U
Trichlorofluoromethane	2	U	m & p-Xylene	2	U
Ethyl Ether	1	U	o-Xylene	1	U
1,1,2 Trichlorotrifluoroethane	1	U	Styrene	2	U
1,1-Dichloroethene	1	U	Bromoform	1	UJ
Acetone	4	U	Isopropylbenzene (Cumene)	1	UJ
Methyl Iodide	1	U	1,1,2,2-Tetrachloroethane	1	U
Carbon Disulfide	1	U	Trans-1,4-Dichloro-2-butene	2	U
Methylene Chloride	2	U	1,2,3-Trichloropropane	1	UJ
Methyl t-butyl ether	1	UJ	Bromobenzene	1	UJ
Trans-1,2-Dichloroethene	1	U	n-Propylbenzene	1	UJ
1,1-Dichloroethane	1	U	2-Chlorotoluene	1	UJ
2-Butanone	2	U	1,3,5-Trimethylbenzene	1	UJ
Cis-1,2-Dichloroethene	1	U	4-Chlorotoluene	1	UJ
2,2-Dichloropropane	2	U	Tert-Butylbenzene	1	UJ
Bromochloromethane	1	U	1,2,4-Trimethylbenzene	1	UJ
Chloroform	.13	J	Pentachloroethane	2	UJ
Tetrahydrofuran	1	U	Sec-Butylbenzene	1	UJ
1,1,1-Trichloroethane	1	U	p-Isopropyltoluene	1	UJ
1,1-Dichloropropene	1	U	1,3-Dichlorobenzene	1	UJ
Carbon Tetrachloride	1	U	1,4-Dichlorobenzene	1	UJ
1,2-Dichloroethane	1	U	n-Butylbenzene	1	UJ
Benzene	1	U	1,2-Dichlorobenzene	1	UJ
Trichloroethene	.25	J	Hexachloroethane	2	UJ
1,2-Dichloropropane	1	U	1,2-Dibromo-3-Chloropropane	2	UJ
Dibromomethane	1	U	1,2,4-Trichlorobenzene	5	UJ
Bromodichloromethane	1	U	Hexachlorobutadiene	5	UJ
Cis-1,3-Dichloropropene	1.1	U	Naphthalene	2	UJ
4-Methyl-2-Pentanone	2	U	1,2,3-Trichlorobenzene	5	UJ
Toluene	1	U			
Trans-1,3-Dichloropropene	.94	U			
1,1,2-Trichloroethane	1	U			
1,3-Dichloropropane	1	U			
2-Hexanone	2	U			
Tetrachloroethene	2.8				

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234020

Date Collected: 06/02/03

Method: SW8260

Field ID: 447W

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/12/03

Units: ug/L

Analyte	Result	Qualifier
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Surrogate Recoveries

1,2-Dichloroethane-D4	102	%
1,4-Difluorobenzene	98	%
Toluene-D8	103	%
p-Bromofluorobenzene	87	%
1,2-Dichlorobenzene-D4	105	%

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey			LIMS Project ID: 1528-03		
Sample: 03234021		Date Collected: 06/02/03		Method: SW8260	
Field ID: 447N		Date Analyzed: 06/12/03		Matrix: Water	
Project Officer: Joyce Mercuri				Units: ug/L	
Analyte	Result	Qualifier	Analyte	Result	Qualifier
Dichlorodifluoromethane	1	U	Dibromochloromethane	2	U
Chloromethane	2	U	1,2-Dibromoethane (EDB)	1	U
Vinyl Chloride	2	U	Chlorobenzene	1	U
Bromomethane	1	U	1,1,1,2-Tetrachloroethane	1	U
Chloroethane	2	U	Ethylbenzene	1	U
Trichlorofluoromethane	2	U	m & p-Xylene	2	U
Ethyl Ether	1	U	o-Xylene	1	U
1,1,2 Trichlorotrifluoroethane	1	U	Styrene	2	U
1,1-Dichloroethene	1	U	Bromoform	1	UJ
Acetone	4	U	Isopropylbenzene (Cumene)	1	UJ
Methyl Iodide	1	U	1,1,2,2-Tetrachloroethane	1	U
Carbon Disulfide	1	U	Trans-1,4-Dichloro-2-butene	2	U
Methylene Chloride	2	U	1,2,3-Trichloropropane	1	UJ
Methyl t-butyl ether	1	UJ	Bromobenzene	1	UJ
Trans-1,2-Dichloroethene	1	U	n-Propylbenzene	1	UJ
1,1-Dichloroethane	1	U	2-Chlorotoluene	1	UJ
2-Butanone	2	U	1,3,5-Trimethylbenzene	1	UJ
Cis-1,2-Dichloroethene	1	U	4-Chlorotoluene	1	UJ
2,2-Dichloropropane	2	U	Tert-Butylbenzene	1	UJ
Bromochloromethane	1	U	1,2,4-Trimethylbenzene	1	UJ
Chloroform	.10	J	Pentachloroethane	2	UJ
Tetrahydrofuran	1	U	Sec-Butylbenzene	1	UJ
1,1,1-Trichloroethane	1	U	p-Isopropyltoluene	1	UJ
1,1-Dichloropropene	1	U	1,3-Dichlorobenzene	1	UJ
Carbon Tetrachloride	1	U	1,4-Dichlorobenzene	1	UJ
1,2-Dichloroethane	1	U	n-Butylbenzene	1	UJ
Benzene	1	U	1,2-Dichlorobenzene	1	UJ
Trichloroethene	7.3		Hexachloroethane	2	UJ
1,2-Dichloropropane	1	U	1,2-Dibromo-3-Chloropropane	2	UJ
Dibromomethane	1	U	1,2,4-Trichlorobenzene	5	UJ
Bromodichloromethane	1	U	Hexachlorobutadiene	5	UJ
Cis-1,3-Dichloropropene	1.1	U	Naphthalene	2	UJ
4-Methyl-2-Pentanone	2	U	1,2,3-Trichlorobenzene	5	UJ
Toluene	.10	J			
Trans-1,3-Dichloropropene	.94	U			
1,1,2-Trichloroethane	1	U			
1,3-Dichloropropane	1	U			
2-Hexanone	2	U			
Tetrachloroethene	1	U			

Authorized By: 

Release Date: 6/20/03

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234021

Date Collected: 06/02/03

Method: SW8260

Field ID: 447N

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/12/03

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Surrogate Recoveries

1,2-Dichloroethane-D4	110	%
1,4-Difluorobenzene	102	%
Toluene-D8	102	%
p-Bromofluorobenzene	89	%
1,2-Dichlorobenzene-D4	106	%

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey			LIMS Project ID: 1528-03		
Sample: 03234022			Date Collected: 06/02/03		
Field ID: 430			Method: SW8260		
Project Officer: Joyce Mercuri			Matrix: Water		
			Units: ug/L		
			Date Analyzed: 06/12/03		
Analyte	Result	Qualifier	Analyte	Result	Qualifier
Dichlorodifluoromethane	1	U	Dibromochloromethane	2	U
Chloromethane	2	U	1,2-Dibromoethane (EDB)	1	U
Vinyl Chloride	2	U	Chlorobenzene	1	U
Bromomethane	1	U	1,1,1,2-Tetrachloroethane	1	U
Chloroethane	2	U	Ethylbenzene	1	U
Trichlorofluoromethane	2	U	m & p-Xylene	2	U
Ethyl Ether	1	U	o-Xylene	1	U
1,1,2 Trichlorotrifluoroethane	1	U	Styrene	2	U
1,1-Dichloroethene	1	U	Bromoform	1	U
Acetone	6.4	UJ	Isopropylbenzene (Cumene)	1	U
Methyl Iodide	1	U	1,1,2,2-Tetrachloroethane	1	U
Carbon Disulfide	1	U	Trans-1,4-Dichloro-2-butene	2	U
Methylene Chloride	2	U	1,2,3-Trichloropropane	1	UJ
Methyl t-butyl ether	1	UJ	Bromobenzene	1	U
Trans-1,2-Dichloroethene	1	U	n-Propylbenzene	1	U
1,1-Dichloroethane	1	U	2-Chlorotoluene	1	U
2-Butanone	2	U	1,3,5-Trimethylbenzene	1	U
Cis-1,2-Dichloroethene	.15	J	4-Chlorotoluene	1	U
2,2-Dichloropropane	2	U	Tert-Butylbenzene	1	U
Bromochloromethane	1	U	1,2,4-Trimethylbenzene	1	U
Chloroform	.11	J	Pentachloroethane	2	U
Tetrahydrofuran	1	U	Sec-Butylbenzene	1	U
1,1,1-Trichloroethane	1	U	p-Isopropyltoluene	1	U
1,1-Dichloropropene	1	U	1,3-Dichlorobenzene	1	U
Carbon Tetrachloride	1	U	1,4-Dichlorobenzene	1	U
1,2-Dichloroethane	1	U	n-Butylbenzene	1	U
Benzene	1	U	1,2-Dichlorobenzene	1	U
Trichloroethene	17		Hexachloroethane	2	U
1,2-Dichloropropane	1	U	1,2-Dibromo-3-Chloropropane	2	U
Dibromomethane	1	U	1,2,4-Trichlorobenzene	5	UJ
Bromodichloromethane	1	U	Hexachlorobutadiene	5	U
Cis-1,3-Dichloropropene	1.1	U	Naphthalene	2	U
4-Methyl-2-Pentanone	2	U	1,2,3-Trichlorobenzene	5	UJ
Toluene	.34	J			
Trans-1,3-Dichloropropene	.94	U			
1,1,2-Trichloroethane	1	U			
1,3-Dichloropropane	1	U			
2-Hexanone	2	U			
Tetrachloroethene	.23	J			

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234022

Date Collected: 06/02/03

Method: SW8260

Field ID: 430

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/12/03

Units: ug/L

Analyte	Result	Qualifier
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Surrogate Recoveries

1,2-Dichloroethane-D4	111	%
1,4-Difluorobenzene	102	%
Toluene-D8	101	%
p-Bromofluorobenzene	88	%
1,2-Dichlorobenzene-D4	105	%

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234023

Date Collected: 06/02/03

Method: SW8260

Field ID: 442

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/12/03

Units: ug/L

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Dichlorodifluoromethane	1	U	Dibromochloromethane	2	U
Chloromethane	2	U	1,2-Dibromoethane (EDB)	1	U
Vinyl Chloride	2	U	Chlorobenzene	1	U
Bromomethane	1	U	1,1,1,2-Tetrachloroethane	1	U
Chloroethane	2	U	Ethylbenzene	1	U
Trichlorofluoromethane	2	U	m & p-Xylene	2	U
Ethyl Ether	1	U	o-Xylene	1	U
1,1,2 Trichlorotrifluoroethane	1	U	Styrene	2	U
1,1-Dichloroethene	1	U	Bromoform	1	UJ
Acetone	4	U	Isopropylbenzene (Cumene)	1	UJ
Methyl Iodide	1	U	1,1,2,2-Tetrachloroethane	1	U
Carbon Disulfide	1	U	Trans-1,4-Dichloro-2-butene	2	U
Methylene Chloride	2	U	1,2,3-Trichloropropane	1	UJ
Methyl t-butyl ether	1	UJ	Bromobenzene	1	UJ
Trans-1,2-Dichloroethene	1	U	n-Propylbenzene	1	UJ
1,1-Dichloroethane	1	U	2-Chlorotoluene	1	UJ
2-Butanone	2	U	1,3,5-Trimethylbenzene	1	UJ
Cis-1,2-Dichloroethene	1	U	4-Chlorotoluene	1	UJ
2,2-Dichloropropane	2	U	Tert-Butylbenzene	1	UJ
Bromochloromethane	1	U	1,2,4-Trimethylbenzene	1	UJ
Chloroform	1	U	Pentachloroethane	2	UJ
Tetrahydrofuran	1	U	Sec-Butylbenzene	1	UJ
1,1,1-Trichloroethane	1	U	p-Isopropyltoluene	1	UJ
1,1-Dichloropropene	1	U	1,3-Dichlorobenzene	1	UJ
Carbon Tetrachloride	1	U	1,4-Dichlorobenzene	1	UJ
1,2-Dichloroethane	1	U	n-Butylbenzene	1	UJ
Benzene	1	U	1,2-Dichlorobenzene	1	UJ
Trichloroethene	7.8		Hexachloroethane	2	UJ
1,2-Dichloropropane	1	U	1,2-Dibromo-3-Chloropropane	2	UJ
Dibromomethane	1	U	1,2,4-Trichlorobenzene	5	UJ
Bromodichloromethane	1	U	Hexachlorobutadiene	5	UJ
Cis-1,3-Dichloropropene	1.1	U	Naphthalene	2	UJ
4-Methyl-2-Pentanone	2	U	1,2,3-Trichlorobenzene	5	UJ
Toluene	1	U			
Trans-1,3-Dichloropropene	.94	U			
1,1,2-Trichloroethane	1	U			
1,3-Dichloropropane	1	U			
2-Hexanone	2	U			
Tetrachloroethene	1	U			

Authorized By: 

Release Date: 6/30/03

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234023

Date Collected: 06/02/03

Method: SW8260

Field ID: 442

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/12/03

Units: ug/L

Analyte	Result	Qualifier
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Surrogate Recoveries

1,2-Dichloroethane-D4	104	%
1,4-Difluorobenzene	98	%
Toluene-D8	103	%
p-Bromofluorobenzene	88	%
1,2-Dichlorobenzene-D4	109	%

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey			LIMS Project ID: 1528-03		
Sample: 03234024		Date Collected: 06/02/03		Method: SW8260	
Field ID: 609N		Date Analyzed: 06/12/03		Matrix: Water	
Project Officer: Joyce Mercuri				Units: ug/L	
Analyte	Result	Qualifier	Analyte	Result	Qualifier
Dichlorodifluoromethane	1	U	Dibromochloromethane	2	U
Chloromethane	2	U	1,2-Dibromoethane (EDB)	1	U
Vinyl Chloride	2	U	Chlorobenzene	1	U
Bromomethane	1	U	1,1,1,2-Tetrachloroethane	1	U
Chloroethane	2	U	Ethylbenzene	1	U
Trichlorofluoromethane	2	U	m & p-Xylene	2	U
Ethyl Ether	1	U	o-Xylene	1	U
1,1,2 Trichlorotrifluoroethane	1	U	Styrene	2	U
1,1-Dichloroethene	1	U	Bromoform	1	UJ
Acetone	4	U	Isopropylbenzene (Cumene)	.49	J
Methyl Iodide	1	U	1,1,2,2-Tetrachloroethane	1	U
Carbon Disulfide	1	U	Trans-1,4-Dichloro-2-butene	2	U
Methylene Chloride	2	U	1,2,3-Trichloropropane	1	UJ
Methyl t-butyl ether	1	UJ	Bromobenzene	1	UJ
Trans-1,2-Dichloroethene	1	U	n-Propylbenzene	.24	J
1,1-Dichloroethane	1	U	2-Chlorotoluene	1	UJ
2-Butanone	2	U	1,3,5-Trimethylbenzene	1	UJ
Cis-1,2-Dichloroethene	.20	J	4-Chlorotoluene	1	UJ
2,2-Dichloropropane	2	U	Tert-Butylbenzene	1	UJ
Bromochloromethane	1	U	1,2,4-Trimethylbenzene	1	UJ
Chloroform	1	U	Pentachloroethane	2	UJ
Tetrahydrofuran	1	U	Sec-Butylbenzene	.18	J
1,1,1-Trichloroethane	1	U	p-Isopropyltoluene	1	UJ
1,1-Dichloropropene	1	U	1,3-Dichlorobenzene	1	UJ
Carbon Tetrachloride	1	U	1,4-Dichlorobenzene	1	UJ
1,2-Dichloroethane	1	U	n-Butylbenzene	1	UJ
Benzene	1	U	1,2-Dichlorobenzene	1	UJ
Trichloroethene	.31	J	Hexachloroethane	2	UJ
1,2-Dichloropropane	1	U	1,2-Dibromo-3-Chloropropane	2	UJ
Dibromomethane	1	U	1,2,4-Trichlorobenzene	5	UJ
Bromodichloromethane	1	U	Hexachlorobutadiene	5	UJ
Cis-1,3-Dichloropropene	1.1	U	Naphthalene	2	UJ
4-Methyl-2-Pentanone	2	U	1,2,3-Trichlorobenzene	5	UJ
Toluene	1	U			
Trans-1,3-Dichloropropene	.94	U			
1,1,2-Trichloroethane	1	U			
1,3-Dichloropropane	1	U			
2-Hexanone	2	U			
Tetrachloroethene	1	U			

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234024

Date Collected: 06/02/03

Method: SW8260

Field ID: 609N

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/12/03

Units: ug/L

Analyte	Result	Qualifier
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Surrogate Recoveries

1,2-Dichloroethane-D4	109	%
1,4-Difluorobenzene	100	%
Toluene-D8	102	%
p-Bromofluorobenzene	91	%
1,2-Dichlorobenzene-D4	107	%

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey			LIMS Project ID: 1528-03		
Sample: 03234025		Date Collected: 06/02/03		Method: SW8260	
Field ID: 609W		Date Analyzed: 06/07/03		Matrix: Water	
Project Officer: Joyce Mercuri				Units: ug/L	
Analyte	Result	Qualifier	Analyte	Result	Qualifier
Dichlorodifluoromethane	1	UJ	Dibromochloromethane	1	U
Chloromethane	1	UJ	1,2-Dibromoethane (EDB)	1	U
Vinyl Chloride	1	UJ	Chlorobenzene	1	U
Bromomethane	1	UJ	1,1,1,2-Tetrachloroethane	1	U
Chloroethane	2	UJ	Ethylbenzene	1	U
Trichlorofluoromethane	2	UJ	m & p-Xylene	2	U
Ethyl Ether	1	UJ	o-Xylene	1	U
1,1,2 Trichlorotrifluoroethane	1	UJ	Styrene	2	U
1,1-Dichloroethene	1	UJ	Bromoform	1	UJ
Acetone	12	UJ	Isopropylbenzene (Cumene)	.23	J
Methyl Iodide	1	UJ	1,1,2,2-Tetrachloroethane	1	U
Carbon Disulfide	2	UJ	Trans-1,4-Dichloro-2-butene	2	U
Methylene Chloride	2	UJ	1,2,3-Trichloropropane	1	UJ
Methyl t-butyl ether	1	UJ	Bromobenzene	1	UJ
Trans-1,2-Dichloroethene	1	UJ	n-Propylbenzene	.46	J
1,1-Dichloroethane	1	UJ	2-Chlorotoluene	1	UJ
2-Butanone	2	UJ	1,3,5-Trimethylbenzene	1	UJ
Cis-1,2-Dichloroethene	1	UJ	4-Chlorotoluene	1	UJ
2,2-Dichloropropane	1	UJ	Tert-Butylbenzene	1	UJ
Bromochloromethane	1	UJ	1,2,4-Trimethylbenzene	1	UJ
Chloroform	1	U	Pentachloroethane	2	UJ
Tetrahydrofuran	1	U	Sec-Butylbenzene	1	UJ
1,1,1-Trichloroethane	1	U	p-Isopropyltoluene	1	UJ
1,1-Dichloropropene	1	U	1,3-Dichlorobenzene	1	UJ
Carbon Tetrachloride	1	U	1,4-Dichlorobenzene	1	UJ
1,2-Dichloroethane	1	UJ	n-Butylbenzene	1	UJ
Benzene	.38	J	1,2-Dichlorobenzene	1	UJ
Trichloroethene	3.8		Hexachloroethane	1	UJ
1,2-Dichloropropane	1	U	1,2-Dibromo-3-Chloropropane	1	UJ
Dibromomethane	1	U	1,2,4-Trichlorobenzene	5	UJ
Bromodichloromethane	1	U	Hexachlorobutadiene	5	UJ
Cis-1,3-Dichloropropene	1.1	U	Naphthalene	2	UJ
4-Methyl-2-Pentanone	2	U	1,2,3-Trichlorobenzene	5	UJ
Toluene	1	U			
Trans-1,3-Dichloropropene	.94	U			
1,1,2-Trichloroethane	1	U			
1,3-Dichloropropane	1	U			
2-Hexanone	2	U			
Tetrachloroethene	.51	J			

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Sample: 03234025

Date Collected: 06/02/03

Method: SW8260

Field ID: 609W

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/07/03

Units: ug/L

Analyte	Result	Qualifier
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Surrogate Recoveries

1,2-Dichloroethane-D4	141	%
1,4-Difluorobenzene	108	%
Toluene-D8	88	%
p-Bromofluorobenzene	84	%
1,2-Dichlorobenzene-D4	107	%

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Lab ID: LCS3157W

Method: SW8260

QC Type: Laboratory Control Sample

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/06/03

Units: %

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Dichlorodifluoromethane	100		Dibromochloromethane	104	
Chloromethane	110		1,2-Dibromoethane (EDB)	102	
Vinyl Chloride	140		Chlorobenzene	105	
Bromomethane	140		1,1,1,2-Tetrachloroethane	99	
Chloroethane	131		Ethylbenzene	101	
Trichlorofluoromethane	101		m & p-Xylene	105	
Ethyl Ether		NAF	o-Xylene	104	
1,1,2 Trichlorotrifluoroethane	125		Styrene	109	
1,1-Dichloroethene	127		Bromoform	93	
Acetone	147		Isopropylbenzene (Cumene)	84	
Methyl Iodide		NAF	1,1,2,2-Tetrachloroethane	105	
Carbon Disulfide	153		Trans-1,4-Dichloro-2-butene		NAF
Methylene Chloride	126		1,2,3-Trichloropropane	68	
Methyl t-butyl ether	72		Bromobenzene	92	
Trans-1,2-Dichloroethene	114		n-Propylbenzene	89	
1,1-Dichloroethane	100		2-Chlorotoluene	84	
2-Butanone	105		1,3,5-Trimethylbenzene	88	
Cis-1,2-Dichloroethene	105		4-Chlorotoluene	92	
2,2-Dichloropropane	98		Tert-Butylbenzene	86	
Bromochloromethane	119		1,2,4-Trimethylbenzene	90	
Chloroform	110		Pentachloroethane	90	
Tetrahydrofuran		NAF	Sec-Butylbenzene	85	
1,1,1-Trichloroethane	88		p-Isopropyltoluene	90	
1,1-Dichloropropene	83		1,3-Dichlorobenzene	98	
Carbon Tetrachloride	107		1,4-Dichlorobenzene	100	
1,2-Dichloroethane	119		n-Butylbenzene	89	
Benzene	82		1,2-Dichlorobenzene	96	
Trichloroethene	85		Hexachloroethane	85	
1,2-Dichloropropane	82		1,2-Dibromo-3-Chloropropane	90	
Dibromomethane	104		1,2,4-Trichlorobenzene	77	
Bromodichloromethane	94		Hexachlorobutadiene	94	
Cis-1,3-Dichloropropene	93		Naphthalene	94	
4-Methyl-2-Pentanone	86		1,2,3-Trichlorobenzene	85	
Toluene	93				
Trans-1,3-Dichloropropene	116				
1,1,2-Trichloroethane	94				
1,3-Dichloropropane	95				
2-Hexanone	102				
Tetrachloroethene	96				

Authorized By: 

Release Date: 6/30/03

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Lab ID: LCS3157AV

Method: SW8260

QC Type: Laboratory Control Sample

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/06/03

Units: %

Analyte	Result	Qualifier
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Surrogate Recoveries

1,2-Dichloroethane-D4	118	%
1,4-Difluorobenzene	103	%
Toluene-D8	89	%
p-Bromofluorobenzene	114	%
1,2-Dichlorobenzene-D4	94	%

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Lab ID: LCS3157X

Method: SW8260

QC Type: Laboratory Control Sample

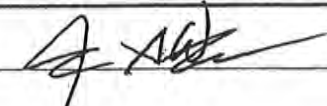
Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/06/03

Units: %

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Dichlorodifluoromethane	133		Dibromochloromethane	105	
Chloromethane	102		1,2-Dibromoethane (EDB)	100	
Vinyl Chloride	134		Chlorobenzene	101	
Bromomethane	140		1,1,1,2-Tetrachloroethane	99	
Chloroethane	119		Ethylbenzene	94	
Trichlorofluoromethane	94		m & p-Xylene	100	
Ethyl Ether		NAF	o-Xylene	99	
1,1,2 Trichlorotrifluoroethane	114		Styrene	102	
1,1-Dichloroethene	117		Bromoform	96	
Acetone	141		Isopropylbenzene (Cumene)	85	
Methyl Iodide		NAF	1,1,2,2-Tetrachloroethane	103	
Carbon Disulfide	137		Trans-1,4-Dichloro-2-butene		NAF
Methylene Chloride	121		1,2,3-Trichloropropane	71	
Methyl t-butyl ether	72		Bromobenzene	94	
Trans-1,2-Dichloroethene	112		n-Propylbenzene	88	
1,1-Dichloroethane	99		2-Chlorotoluene	85	
2-Butanone	109		1,3,5-Trimethylbenzene	86	
Cis-1,2-Dichloroethene	102		4-Chlorotoluene	91	
2,2-Dichloropropane	95		Tert-Butylbenzene	86	
Bromochloromethane	118		1,2,4-Trimethylbenzene	88	
Chloroform	108		Pentachloroethane	92	
Tetrahydrofuran		NAF	Sec-Butylbenzene	85	
1,1,1-Trichloroethane	85		p-Isopropyltoluene	87	
1,1-Dichloropropene	83		1,3-Dichlorobenzene	96	
Carbon Tetrachloride	107		1,4-Dichlorobenzene	100	
1,2-Dichloroethane	118		n-Butylbenzene	86	
Benzene	82		1,2-Dichlorobenzene	94	
Trichloroethene	86		Hexachloroethane	85	
1,2-Dichloropropane	83		1,2-Dibromo-3-Chloropropane	92	
Dibromomethane	101		1,2,4-Trichlorobenzene	79	
Bromodichloromethane	95		Hexachlorobutadiene	92	
Cis-1,3-Dichloropropene	91		Naphthalene	96	
4-Methyl-2-Pentanone	85		1,2,3-Trichlorobenzene	89	
Toluene	90				
Trans-1,3-Dichloropropene	112				
1,1,2-Trichloroethane	93				
1,3-Dichloropropane	94				
2-Hexanone	99				
Tetrachloroethene	96				

Authorized By: 

Release Date: 6/30/03

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Lab ID: TCS3157X

Method: SW8260

QC Type: Laboratory Control Sample

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/06/03

Units: %

Analyte	Result	Qualifier
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Surrogate Recoveries

1,2-Dichloroethane-D4	%
1,4-Difluorobenzene	%
Toluene-D8	%
p-Bromofluorobenzene	%
1,2-Dichlorobenzene-D4	%

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Lab ID: OBW3157

Method: SW8260

QC Type: Laboratory Method Blank

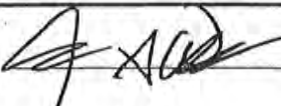
Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/06/03

Units: ug/L

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Dichlorodifluoromethane	1	U	Dibromochloromethane	1	U
Chloromethane	1	U	1,2-Dibromoethane (EDB)	1	U
Vinyl Chloride	1	U	Chlorobenzene	1	U
Bromomethane	1	U	1,1,1,2-Tetrachloroethane	1	U
Chloroethane	2	U	Ethylbenzene	1	U
Trichlorofluoromethane	2	U	m & p-Xylene	2	U
Ethyl Ether	1	U	o-Xylene	1	U
1,1,2 Trichlorotrifluoroethane	1	U	Styrene	2	U
1,1-Dichloroethene	1	U	Bromoform	1	UJ
Acetone	4.5		Isopropylbenzene (Cumene)	1	UJ
Methyl Iodide	1	U	1,1,2,2-Tetrachloroethane	1	U
Carbon Disulfide	2	U	Trans-1,4-Dichloro-2-butene	2	U
Methylene Chloride	2	U	1,2,3-Trichloropropane	1	UJ
Methyl t-butyl ether	1	UJ	Bromobenzene	1	UJ
Trans-1,2-Dichloroethene	1	U	n-Propylbenzene	1	UJ
1,1-Dichloroethane	1	U	2-Chlorotoluene	1	UJ
2-Butanone	2	U	1,3,5-Trimethylbenzene	1	UJ
Cis-1,2-Dichloroethene	1	U	4-Chlorotoluene	1	UJ
2,2-Dichloropropane	1	U	Tert-Butylbenzene	1	UJ
Bromochloromethane	1	U	1,2,4-Trimethylbenzene	1	UJ
Chloroform	1	U	Pentachloroethane	2	UJ
Tetrahydrofuran	1	U	Sec-Butylbenzene	1	UJ
1,1,1-Trichloroethane	1	U	p-Isopropyltoluene	1	UJ
1,1-Dichloropropene	1	U	1,3-Dichlorobenzene	1	UJ
Carbon Tetrachloride	1	U	1,4-Dichlorobenzene	1	UJ
1,2-Dichloroethane	1	U	n-Butylbenzene	1	UJ
Benzene	1	U	1,2-Dichlorobenzene	1	UJ
Trichloroethene	1	U	Hexachloroethane	1	UJ
1,2-Dichloropropane	1	U	1,2-Dibromo-3-Chloropropane	1	UJ
Dibromomethane	1	U	1,2,4-Trichlorobenzene	5	UJ
Bromodichloromethane	1	U	Hexachlorobutadiene	5	UJ
Cis-1,3-Dichloropropene	1.1	U	Naphthalene	2	UJ
4-Methyl-2-Pentanone	2	U	1,2,3-Trichlorobenzene	5	UJ
Toluene	1	U			
Trans-1,3-Dichloropropene	.94	U			
1,1,2-Trichloroethane	1	U			
1,3-Dichloropropane	1	U			
2-Hexanone	2	U			
Tetrachloroethene	1	U			

Authorized By: 

Release Date: 6/30/03

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Lab ID: OBW3157

Method: SW8260

QC Type: Laboratory Method Blank

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/06/03

Units: ug/L

Analyte	Result	Qualifier
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Surrogate Recoveries

1,2-Dichloroethane-D4	117	%
1,4-Difluorobenzene	101	%
Toluene-D8	87	%
p-Bromofluorobenzene	85	%
1,2-Dichlorobenzene-D4	104	%

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Lab ID: OBW3163B

Method: SW8260

QC Type: Laboratory Method Blank

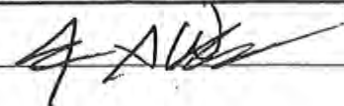
Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/12/03

Units: ug/L

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Dichlorodifluoromethane	1	U	Dibromochloromethane	2	U
Chloromethane	2	U	1,2-Dibromoethane (EDB)	1	U
Vinyl Chloride	2	U	Chlorobenzene	1	U
Bromomethane	1	U	1,1,1,2-Tetrachloroethane	1	U
Chloroethane	2	U	Ethylbenzene	1	U
Trichlorofluoromethane	2	U	m & p-Xylene	2	U
Ethyl Ether	1	U	o-Xylene	1	U
1,1,2 Trichlorotrifluoroethane	1	U	Styrene	2	U
1,1-Dichloroethene	1	U	Bromoform	1	U
Acetone	4.2		Isopropylbenzene (Cumene)	1	U
Methyl Iodide	1	U	1,1,2,2-Tetrachloroethane	1	U
Carbon Disulfide	1	U	Trans-1,4-Dichloro-2-butene	2	U
Methylene Chloride	2	U	1,2,3-Trichloropropane	1	UJ
Methyl t-butyl ether	1	UJ	Bromobenzene	1	U
Trans-1,2-Dichloroethene	1	U	n-Propylbenzene	1	U
1,1-Dichloroethane	1	U	2-Chlorotoluene	1	U
2-Butanone	2	U	1,3,5-Trimethylbenzene	1	U
Cis-1,2-Dichloroethene	1	U	4-Chlorotoluene	1	U
2,2-Dichloropropane	2	U	Tert-Butylbenzene	1	U
Bromochloromethane	1	U	1,2,4-Trimethylbenzene	1	U
Chloroform	1	U	Pentachloroethane	2	U
Tetrahydrofuran	1	U	Sec-Butylbenzene	1	U
1,1,1-Trichloroethane	1	U	p-Isopropyltoluene	1	U
1,1-Dichloropropene	1	U	1,3-Dichlorobenzene	1	U
Carbon Tetrachloride	1	U	1,4-Dichlorobenzene	1	U
1,2-Dichloroethane	1	U	n-Butylbenzene	1	U
Benzene	1	U	1,2-Dichlorobenzene	1	U
Trichloroethene	1	U	Hexachloroethane	2	U
1,2-Dichloropropane	1	U	1,2-Dibromo-3-Chloropropane	2	U
Dibromomethane	1	U	1,2,4-Trichlorobenzene	5	UJ
Bromodichloromethane	1	U	Hexachlorobutadiene	5	U
Cis-1,3-Dichloropropene	1.1	U	Naphthalene	5	J
4-Methyl-2-Pentanone	2	U	1,2,3-Trichlorobenzene	5	UJ
Toluene	1	U			
Trans-1,3-Dichloropropene	.94	U			
1,1,2-Trichloroethane	1	U			
1,3-Dichloropropane	1	U			
2-Hexanone	2	U			
Tetrachloroethene	1	U			

Authorized By: 

Release Date: 6/30/03

Page: 1

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Lab ID: OBW3163B

Method: SW8260

QC Type: Laboratory Method Blank

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 06/12/03

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Surrogate Recoveries

1,2-Dichloroethane-D4	104	%
1,4-Difluorobenzene	99	%
Toluene-D8	102	%
p-Bromofluorobenzene	88	%
1,2-Dichlorobenzene-D4	106	%

Washington State Department of Ecology
Manchester Environmental Laboratory
Project Statement

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Project Officer: Joyce Mercuri

Start Date: 06/04/03

Location: SWRO

Due Date: 07/04/03

Program: TCP

Statement Date: 07/01/03

Samples:

Parameter	Matrix	Method	Lab	Qty	Unit Price	Extended Price
HCID	10	HYDRO-ID	ECO	4	\$81	\$324
TPHG	10	NWTPH-GX	ECO	6	\$78	\$468
VOA	10	SW8260	ECO	6	\$156	\$936

PIC	%	In House	Contract	Generals	Metals	Organics	Bioassay	Special	Total
J1B29	100	\$1,728	\$0	\$0	\$0	\$1,728	\$0	\$0	\$1,728
Totals:		\$1,728	\$0	\$0	\$0	\$1,728	\$0	\$0	\$1,728

RECEIVED
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Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366

'03 JUN -9 110 38

Case Narrative

June 5, 2003

Subject: Pugnetti Drain Survey Project

Sample(s): 03234020-21 and 03234024-25

Officer(s): Joyce Mercuri

By: Bob Carrell *B*

Hydrocarbon Identification Analysis

Analytical Method(s)

These samples were extracted with methylene chloride and analyzed, along with a method blank and various petroleum product standards, by gas chromatography with flame ionization detection (GC/FID). This method is consistent with a modified EPA SW-846 Method 8015B and/or ASTM Method D-3328.

Holding Times

The samples were extracted and analyzed after the recommended method holding times.

Calibration

This is not applicable in the traditional sense since only various petroleum products standards are analyzed to establish chromatographic product "fingerprints".

Blanks

No analytically significant levels of any analyte were detected in the method blanks associated with these samples.

Comments

The results of the HCID analyses showed that samples 03234020-21 did not contained any detectable petroleum hydrocarbons or products while samples 03234024-25 contained a small amount of a few very early eluting compounds which did not have any recognizable petroleum pattern.

Washington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Hydrocarbon Identification

Project Name: Pugnetti Drain Survey

LIMS Project ID: 1528-03

Project Officer: Joyce Mercuri

Method: HYDRO-ID

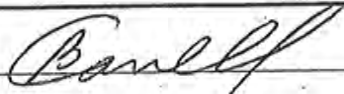
Date Reported: 06/05/03

Analyte: Hydrocarbon identification

Sample	QC	Field ID	Matrix	Result	Qualifier	Units	Collected	Analyzed
*03234020		447W	Water		NC	mg/L	06/02/03	06/04/03
*03234021		447N	Water		NC	mg/L	06/02/03	06/04/03
*03234024		609N	Water		NC	mg/L	06/02/03	06/04/03
*03234025		609W	Water		NC	mg/L	06/02/03	06/04/03
*OBW3155HC		Lab BLNK	Water		NC	mg/L		06/04/03

Comments:

03234020 This sample does not contain any detectable petroleum hydrocarbons or products.
03234021 This sample does not contain any detectable petroleum hydrocarbons or products.
03234024 This sample contains a few very early eluting compounds but they do not represent a recognizable petroleum pattern.
03234025 This sample contains a few very early eluting compounds but they do not represent a recognizable petroleum pattern.
OBW3155HC No detectable petroleum hydrocarbons or products found.

Authorized By: 

Release Date: 6-5-03

Page: 1

MEMORANDUM

April 18, 2002

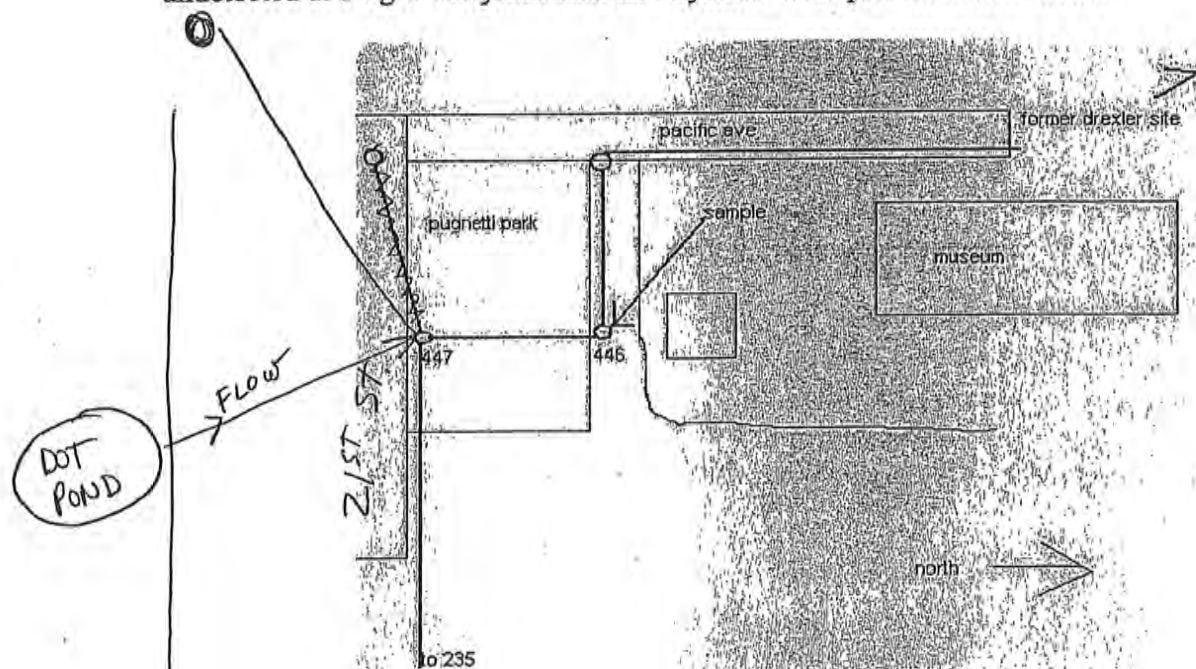
TO: Pugnetti Park File

FROM: Joyce Mercuri, Department of Ecology Site Manager

RE: Sampling for volatile organics – 3/28/02

The attached samples were obtained from water flowing through manhole 446 to the north of the Pugnetti Park Site. City of Tacoma staff Jim Oberlander obtained the samples by dropping tethered VOA vials into the manhole and allowing them to fill in the moving stream. The manhole is in the Washington State History Museum Driveway. The sample was obtained on a dry day, therefore presumably represents groundwater infiltrating into the storm pipe. The water was sampled for volatile organics due to the concern that these chemicals could be coming onto the Pugnetti Park site from an upgradient source (former Drexler site).

Sample results show that some volatile organics are present at relatively low levels – all below MTCA method B criteria for protection of surface water. However, it is important to note that the rapidly flowing water may cause chemicals to volatilize. Benzene was undetected at 1 ug/l. Ethylbenzene and xylenes were present at low levels.



Site Diagram:

We also looked for MW 8, possibly remaining well from earlier investigations as the museum site. Maps show the well located at the northeast corner of Pugnetti Park, just where the museum driveway turns to the north. We could not find any evidence of the well.

RECEIVED
DEPT OF ECOLOGY/SWRO
Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366

APR 10 10:47

Case Narrative

April 4, 2002

Subject: Volatiles Data

Samples: 02138050

Officer: Joyce Mercuri

By: John Weakland



Volatiles Analysis

Analytical Method

The water sample was analyzed by SW-846 8260 for volatile organic compounds.

Holding Times

All samples were prepared and analyzed within the method holding times.

Instrument Tuning

Calibration against Bromofluorobenzene (BFB) is acceptable for the initial calibration, continuing calibration and all associated sample analyses.

Calibration

The average relative response factors for target analytes were above the minimum and % Relative Standard Deviations were within the maximum of 20% with notable exceptions. Four analytes had responses that exceeded established QC limits. However, none of the analytes were detected in the sample and no further corrective action or data qualification was necessary.

Blanks

The method blank ODBW2093 contained Acetone. However, the associated sample contained Acetone at a level 10 times less than the method blank and reported not detected at the Practical Quantitation Limit.

Surrogates

The surrogate recoveries were reasonable, acceptable, and within established QC limits. with the following exceptions. The percent recovery of the surrogate Toluene-d₈ for both LCS samples was slightly above established QC limits. However, all of the other surrogate recoveries were within QC limits and no further action or qualification of the data was necessary.

Matrix Spikes

There was insufficient sample volume for matrix spikes.

Laboratory Control Samples

The percent recovery of both LCS2093 samples were within established QC limits. The RPD of Acetone was outside established of established QC limits. This out of control event is attributed to background levels of Acetone present. Since the analyte detected in the sample was below background levels, no qualification of the data was necessary.

Comments

Data Qualifier Codes

- U - The analyte was not detected at or above the reported result.
- J - The analyte was positively identified. The associated numerical result is an estimate.
- UJ - The analyte was not detected at or above the reported estimated result.
- REJ - The data are unusable for all purposes.
- NAF - Not analyzed for.
- N - For organic analytes there is evidence the analyte is present in this sample.
- NJ - There is evidence that the analyte is present. The associated numerical result is an estimate.
- NC - Not Calculated
- E - The concentration exceeds the known calibration range.
- bold** - The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)

Manchester Environmental Laboratory

Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Park 3/28/02			LIMS Project ID: 1296-02		
Sample: 02138050			Date Collected: 03/28/02		
Field ID: MH446			Method: SW8260		
Project Officer: Joyce Mercuri			Matrix: Water		
			Units: ug/L		
			Date Analyzed: 04/03/02		
Analyte	Result	Qualifier	Analyte	Result	Qualifier
Dichlorodifluoromethane	1	U	Dibromochloromethane	1	U
Chloromethane	2	U	1,2-Dibromoethane (EDB)	1	U
Vinyl Chloride	1	U	Chlorobenzene	1	U
Bromomethane	1	U	1,1,1,2-Tetrachloroethane	1	U
Chloroethane	1	U	Ethylbenzene	4	
Trichlorofluoromethane	2	U	m & p-Xylene	11	
Ethyl Ether	1	U	o-Xylene	2.7	
1,1,2 Trichlorotrifluoroethane	1	U	Styrene	1	U
1,1-Dichloroethene	2	U	Bromoform	1	U
Acetone	2.6	UJ	Isopropylbenzene (Cumene)	1	U
Methyl Iodide	1	U	1,1,2,2-Tetrachloroethane	1	U
Carbon Disulfide	2	U	Trans-1,4-Dichloro-2-butene	1	U
Methylene Chloride	1	U	1,2,3-Trichloropropane	1	U
Methyl t-butyl ether	1	U	Bromobenzene	1	U
Trans-1,2-Dichloroethene	1	U	n-Propylbenzene	1	U
1,1-Dichloroethane	1	U	2-Chlorotoluene	1	U
2-Butanone	2	U	1,3,5-Trimethylbenzene	1	U
Cis-1,2-Dichloroethene	.42	J	4-Chlorotoluene	1	U
2,2-Dichloropropane	2	U	Tert-Butylbenzene	1	U
Bromochloromethane	2	U	1,2,4-Trimethylbenzene	1	U
Chloroform	1	U	Pentachloroethane	1	U
Tetrahydrofuran	1	U	Sec-Butylbenzene	1	U
1,1,1-Trichloroethane	1	U	p-Isopropyltoluene	1	U
1,1-Dichloropropene	1	U	1,3-Dichlorobenzene	1	U
Carbon Tetrachloride	1	U	1,4-Dichlorobenzene	1	U
1,2-Dichloroethane	1	U	n-Butylbenzene	1	U
Benzene	1	U	1,2-Dichlorobenzene	1	U
Trichloroethene	.36	J	Hexachloroethane	5	U
1,2-Dichloropropane	1	U	1,2-Dibromo-3-Chloropropane	1	U
Dibromomethane	1	U	1,2,4-Trichlorobenzene	2	U
Bromodichloromethane	1	U	Hexachlorobutadiene	1	U
Cis-1,3-Dichloropropene	1.1	U	Naphthalene	5	U
4-Methyl-2-Pentanone	2	U	1,2,3-Trichlorobenzene	5	U
Toluene	1	U			
Trans-1,3-Dichloropropene	.94	U			
1,1,2-Trichloroethane	1	U			
1,3-Dichloropropane	2	U			
2-Hexanone	2	U			
Tetrachloroethene	3.3				

Authorized By: 

Release Date:

4/4/02

Page: 1

WATER - VOA'S

Washtington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Park 3/28/02

LIMS Project ID: 1296-02

Sample: 02138050

Date Collected: 03/28/02

Method: SW8260

Field ID: MH446

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 04/03/02

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Surrogate Recoveries

1,2-Dichloroethane-D4	102	%
1,4-Difluorobenzene	96	%
Toluene-D8	98	%
p-Bromofluorobenzene	90	%
1,2-Dichlorobenzene-D4	105	%

Authorized By: 

Release Date: 4/4/02

Page: 2

Surrogates

Manchester Environmental Laboratory

Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Park 3/28/02

LIMS Project ID: 1296-02

Lab ID: ODBW2093

Method: SW8260

QC Type: Laboratory Method Blank

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 04/03/02

Units: ug/L

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Dichlorodifluoromethane	1	U	Dibromochloromethane	1	U
Chloromethane	2	U	1,2-Dibromoethane (EDB)	1	U
Vinyl Chloride	1	U	Chlorobenzene	1	U
Bromomethane	1	U	1,1,1,2-Tetrachloroethane	1	U
Chloroethane	1	U	Ethylbenzene	1	U
Trichlorofluoromethane	2	U	m & p-Xylene	1	U
Ethyl Ether	1	U	o-Xylene	1	U
1,1,2 Trichlorotrifluoroethane	1	U	Styrene	1	U
1,1-Dichloroethene	2	U	Bromoform	1	U
Acetone	1.4	J	Isopropylbenzene (Cumene)	1	U
Methyl Iodide	1	U	1,1,2,2-Tetrachloroethane	1	U
Carbon Disulfide	2	U	Trans-1,4-Dichloro-2-butene	1	U
Methylene Chloride	1	U	1,2,3-Trichloropropane	1	U
Methyl t-butyl ether	1	U	Bromobenzene	1	U
Trans-1,2-Dichloroethene	1	U	n-Propylbenzene	1	U
1,1-Dichloroethane	1	U	2-Chlorotoluene	1	U
2-Butanone	2	U	1,3,5-Trimethylbenzene	1	U
Cis-1,2-Dichloroethene	1	U	4-Chlorotoluene	1	U
2,2-Dichloropropane	2	U	Tert-Butylbenzene	1	U
Bromochloromethane	2	U	1,2,4-Trimethylbenzene	1	U
Chloroform	1	U	Pentachloroethane	1	U
Tetrahydrofuran	1	U	Sec-Butylbenzene	1	U
1,1,1-Trichloroethane	1	U	p-Isopropyltoluene	1	U
1,1-Dichloropropene	1	U	1,3-Dichlorobenzene	1	U
Carbon Tetrachloride	1	U	1,4-Dichlorobenzene	1	U
1,2-Dichloroethane	1	U	n-Butylbenzene	1	U
Benzene	1	U	1,2-Dichlorobenzene	1	U
Trichloroethene	2	U	Hexachloroethane	5	U
1,2-Dichloropropane	1	U	1,2-Dibromo-3-Chloropropane	1	U
Dibromomethane	1	U	1,2,4-Trichlorobenzene	2	U
Bromodichloromethane	1	U	Hexachlorobutadiene	1	U
Cis-1,3-Dichloropropene	1.1	U	Naphthalene	5	U
4-Methyl-2-Pentanone	2	U	1,2,3-Trichlorobenzene	5	U
Toluene	1	U			
Trans-1,3-Dichloropropene	.94	U			
1,1,2-Trichloroethane	1	U			
1,3-Dichloropropane	2	U			
2-Hexanone	2	U			
Tetrachloroethene	1	U			

Authorized By:

Release Date:

4/8/02

Page: 1

Lab Blank

Washtington State Department of Ecology
Manchester Environmental Laboratory
Analysis Report for
Volatile Organic Analysis

Project Name: Pugnetti Park 3/28/02

LIMS Project ID: 1296-02

Lab ID: ODBW2093

Method: SW8260

QC Type: Laboratory Method Blank

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 04/03/02

Units: ug/L

Analyte	Result	Qualifier
---------	--------	-----------

Surrogate Recoveries

1,2-Dichloroethane-D4	99	%
1,4-Difluorobenzene	96	%
Toluene-D8	104	%
p-Bromofluorobenzene	88	%
1,2-Dichlorobenzene-D4	105	%

Authorized By: 

Release Date: 4/8/02

Page: 2

Lab Blank

Manchester Environmental Laboratory

Analysis Report for Volatile Organic Analysis

Project Name: Pugnetti Park 3/28/02

LIMS Project ID: 1296-02

Lab ID: LCS2093

Method: SW8260

QC Type: Laboratory Control Sample

Matrix: Water

Project Officer: Joyce Mercuri

Date Analyzed: 04/03/02

Units: %

Analyte	Result	Qualifier	Analyte	Result	Qualifier
Dichlorodifluoromethane	69		m & p-Xylene	101	
Chloromethane	83		o-Xylene	103	
Vinyl Chloride	79		Styrene	106	
Bromomethane	57		Bromoform	91	
Chloroethane	75		Isopropylbenzene (Cumene)	97	
1,1-Dichloroethene	76		1,1,2,2-Tetrachloroethane	102	
Acetone	147		1,2,3-Trichloropropane	69	
Carbon Disulfide	82		Bromobenzene	94	
Methylene Chloride	84		n-Propylbenzene	94	
Methyl t-butyl ether	86		2-Chlorotoluene	92	
Trans-1,2-Dichloroethene	93		1,3,5-Trimethylbenzene	95	
1,1-Dichloroethane	96		4-Chlorotoluene	98	
2-Butanone	78		Tert-Butylbenzene	99	
Cis-1,2-Dichloroethene	96		1,2,4-Trimethylbenzene	91	
2,2-Dichloropropane	87		Pentachloroethane	93	
Bromochloromethane	100		Sec-Butylbenzene	93	
Chloroform	100		p-Isopropyltoluene	92	
1,1,1-Trichloroethane	105		1,3-Dichlorobenzene	99	
1,1-Dichloropropene	103		1,4-Dichlorobenzene	99	
Carbon Tetrachloride	101		n-Butylbenzene	97	
1,2-Dichloroethane	97		1,2-Dichlorobenzene	95	
Benzene	106		Hexachloroethane	88	
Trichloroethene	107		1,2-Dibromo-3-Chloropropane	107	
1,2-Dichloropropane	109		1,2,4-Trichlorobenzene	89	
Dibromomethane	104		Hexachlorobutadiene	97	
Bromodichloromethane	103		Naphthalene	92	
Cis-1,3-Dichloropropene	98		1,2,3-Trichlorobenzene	98	
4-Methyl-2-Pentanone	92				
Toluene	106		Surrogate Recoveries		
Trans-1,3-Dichloropropene	105				
1,1,2-Trichloroethane	98		1,2-Dichloroethane-D4	90	%
1,3-Dichloropropane	97		1,4-Difluorobenzene	96	%
2-Hexanone	96		Toluene-D8	111	%
Tetrachloroethene	95		p-Bromofluorobenzene	103	%
Dibromochloromethane	98		1,2-Dichlorobenzene-D4	97	%
1,2-Dibromoethane (EDB)	101				
Chlorobenzene	102				
1,1,1,2-Tetrachloroethane	95				
Ethylbenzene	99				

Authorized By: 

Release Date: 4/4/02

Page: 1

Lab Control

Washington State Department of Ecology
 Manchester Environmental Laboratory
 Project Statement

Project Name: Pugnetti Park 3/28/02

LIMS Project ID: 1296-02

Project Officer: Joyce Mercuri

Start Date: 03/29/02

Location: SWRO

Due Date: 04/29/02

Program: TCP

Statement Date: 04/09/02

Samples:

Parameter	Matrix	Method	Lab	Qty	Unit Price	Extended Price
VOA	10	SW8260	ECO	1	\$156	\$156

PIC	%	In House	Contract	Generals	Metals	Organics	Bioassay	Special	Total
J1B29	100	\$156	\$0	\$0	\$0	\$156	\$0	\$0	\$156
Totals:		\$156	\$0	\$0	\$0	\$156	\$0	\$0	\$156

APPENDIX E



Federico Cruz-Urbe, MD, MPH
Director of Health

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Board of Health

- Community Based
- Competitive
- Integrated
- Preventive

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August 1, 2000

Rebecca Lawson P.E.
Toxics Cleanup Program
Department of Ecology
P.O. Box 47775
Olympia, WA 98504-7775

Re: Initial Investigation: Pugnetti Park – 21st and Pacific Ave. Tacoma, WA

Dear Ms. Lawson:

Enclosed is an Initial Investigation report for the above noted site. The Tacoma-Pierce County Health Department responded to a service request at this site by the City of Tacoma Public Utilities Department.

The TPCHD has temporarily assigned # TPCHD070600 as an Incident Response number for this site. Please forward to Marcy Duenhoelter the Ecology assigned identification number. The TPCHD will replace the current identifier with Ecology's number.

At this time, the TPCHD is working with Bob Warren (DOE) to determine possible further investigation and cleanup activities by the Department of Transportation for this site. Depending on the future activities planned for this site, the TPCHD may recommend ranking this site through the Site Hazard Assessment program.

If you have any questions regarding this site, please contact me at (253) 798-2851.

Sincerely,

Brad D. Harp
Source Protection Program
Tacoma-Pierce County Health Department

Enc.

Cc: Bob Warren, Department of Ecology
Troy Naccarato, City of Tacoma

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TACOMA-PIERCE COUNTY HEALTH DEPARTMENT

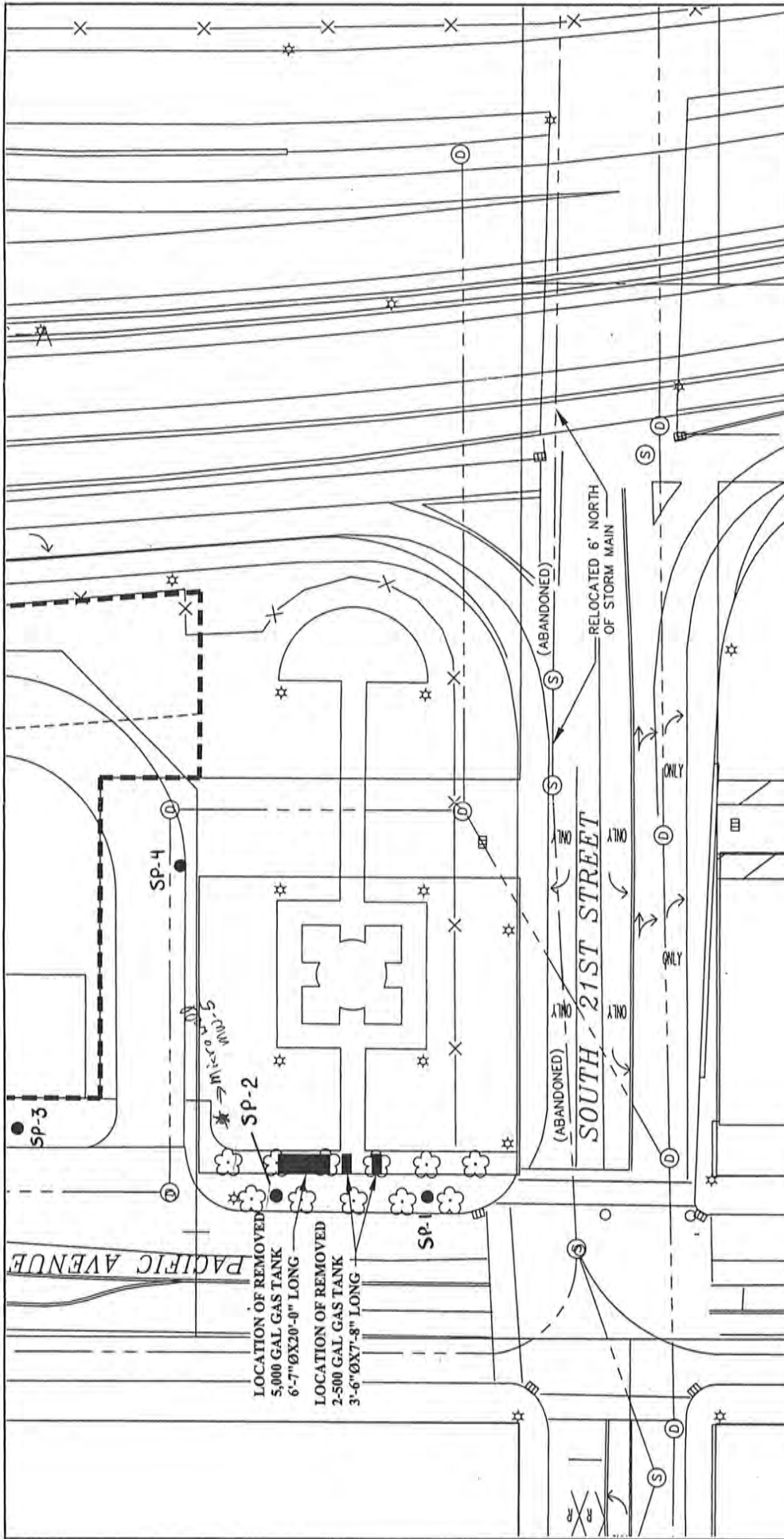
Site Hazard Assessment – Initial Investigation Report

Incident ID:	TPCHD070600 (temp TPCHD ID#, needs Ecology # assigned)		
County:	Pierce		
Date of Investigation:	February 2, 2000 (ongoing through June 22, 2000)		
Time On Site:	10:00 am (Initial site inspection)		
Weather Conditions:	Partly cloudy and cool		
Inspectors:	Mark LaVergne (TPCHD), Brad Harp (TPCHD), Troy Naccarato (City of Tacoma)		
Site Name:	Pugnetti Park / Washington State Historical Museum		
Type of Operation:	City Park / Education-Government		
Site Location:	21 st and Pacific Avenue, Tacoma, WA		
Contact:	Jeff Sawyer Washington State Department of Transportation P.O. Box 47440 Olympia, WA 98504-7440		
Site Representative:	Jeff Sawyer	Title:	Owner Representative
		Phone:	(360) 357-2713

Background

Mr. Troy Naccarato of the City of Tacoma contacted the Tacoma-Pierce County Health Department (TPCHD) in February 2000 concerning petroleum odors emanating from storm drains and catch basins adjacent to the Washington State Historical Museum. The Historical Museum is located at approximately 1950 Pacific Avenue in downtown Tacoma. Contact was made with the TPCHD because of the TPCHD's past involvement with Underground Storage Tank (UST) removal and contamination cleanup activities prior to Historical Museum construction. Preliminarily, the City of Tacoma had thought that the source of the odor was from contamination remaining on site from past UST activities.

The petroleum contaminant concerns were isolated to the southern end of the Historical Museum property and Pugnetti Park (Figure 1.). Samples had been taken of stormwater infiltrate at a location on the east side of the museum and on the south side of Pugnetti Park (see Figure 2., park is outlined in red). Water samples were taken within catch basins where cracks or holes in the storm water system allowed groundwater to “infiltrate” into the system. Both samples indicated elevated levels of petroleum contaminants (Attachment A). Stormwater samples taken from the system away from areas affected by the “infiltration” did not contain petroleum contamination. Petroleum contamination sources to the stormwater system around the park and museum were therefore isolated to the “infiltrates”.



NOTES:

1. LOCATIONS OF REMOVED UST's ARE BASED UPON BUILDING PLANS.
2. GIS BASE MAP DOES NOT REFLECT CHANGES MADE TO 21ST STREET INTERSECTION FROM SR-509 CONSTRUCTION.

CITY OF TACOMA DEPARTMENT OF PUBLIC WORKS		Pugnetti Park So. 21st Street & Pacific ave. GIS Information	
DATE	7/11/00	SCALE	1"=40'
DRAWN BY	TN	UTILITY SERVICES ENGINEER BY	MMWDS
CHECKED BY	RG	ASST. PUBLIC WORKS SECURITY SERVICES	
IN CHARGE	TN	DIRECTOR OF PUBLIC WORKS	
		SHEET 1 OF 1 PUG-PARK.dwg	



This drawing is neither a legally recorded map nor a survey and is intended to be used as one. To be used for reference purposes only. The City of Tacoma is not responsible for any inaccuracies herein contained.

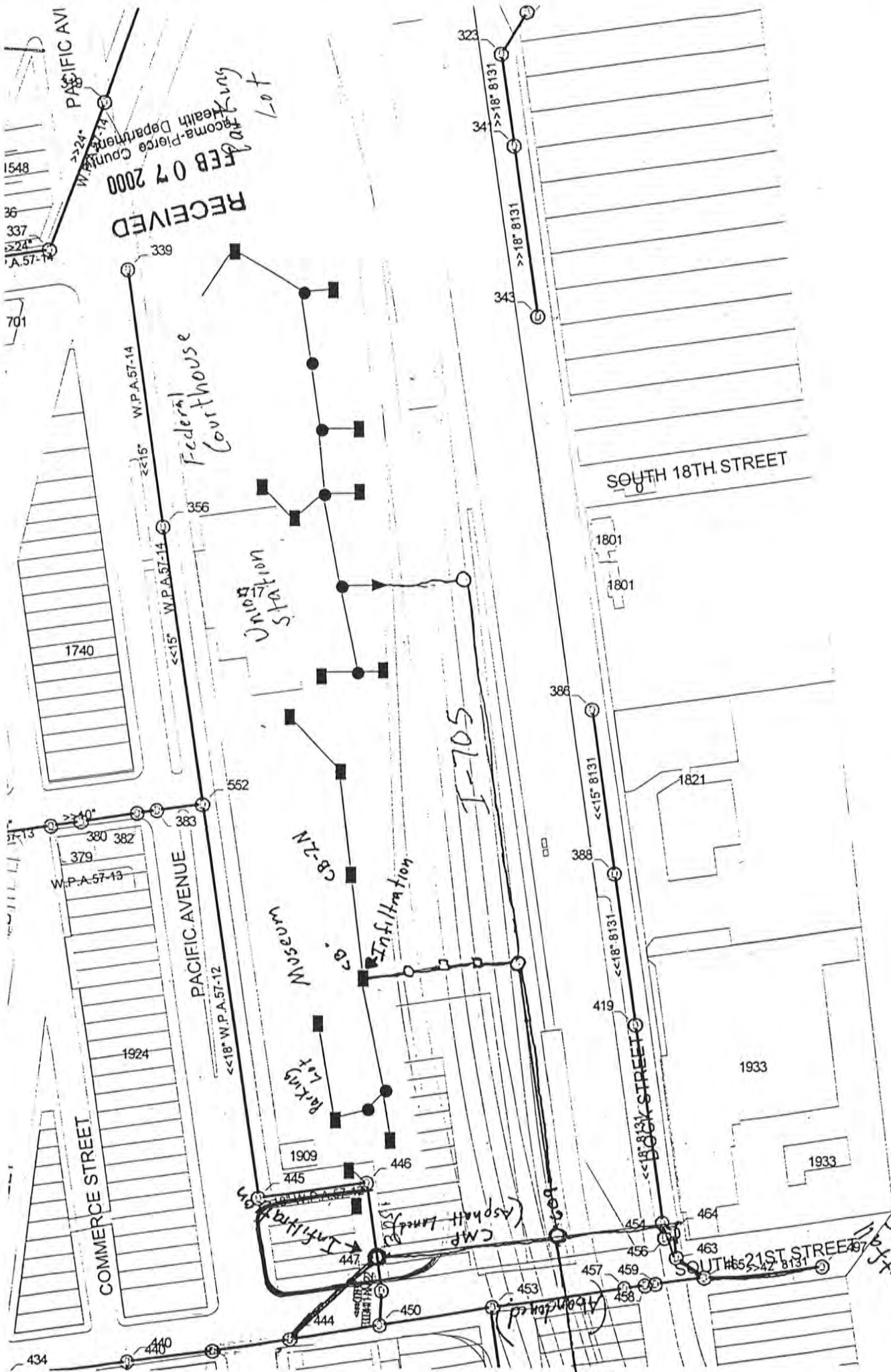


Figure 2

Thea Foss
Watway

PUBLIC
PLACE

The TPCHD had indicated during cleanup activity at the museum site that petroleum contamination was coming onto the property from an undetermined location to the south or southwest of the museum site. This determination was made using information gathered from groundwater monitoring wells that were located at the south end of the museum property. The City of Tacoma was alerted to the possibility of contamination from off site migration at the time of UST remedial activity in 1991.

The soil and groundwater contamination sources originating from the museum property was determined to be fully remediated after review by the TPCHD. The TPCHD noted possible off site contamination, recommended ongoing sampling of the monitoring wells located at the south end of the museum property, and recommended that a passive vapor extraction system be installed beneath the south end of the museum facility. The vapor extraction system was recommended to deal with the possible build up of vapors due to migration of petroleum contaminants from the unknown off site source.

Stormwater System

During field investigations on 2/20/00, 3/01/00, and 3/21/00, a strong petroleum odor was present in and around several of the stormwater catch basins on the east and south sides of the history museum, and on the south side of Pugnetti Park.

Petroleum contaminated groundwater infiltrating into the stormwater system is being addressed by the historical museum and DOT. Gelco Services Incorporated repaired the infiltrate into the catch basin at the historical museum site on June 5, 2000. Mr. Warren of the DOE requested a schedule of repair from the DOT in a letter dated March 29, 2000. However, repair of the infiltrate into the DOT's section of the local stormwater system has not been completed as of this date.

Contamination Source Investigation

During two meetings (3/01/00 and 3/21/00) with Mr. Naccarato, Jeff Sawyer (DOT), Bob Warren (DOE) and Larry McDonald (Washington State Historical Museum) information was provided that indicated the presence of a full service Texaco-B.F. Goodrich gas station at the location of the present day park. The gas station appeared to be in operation from the early 1930's to the mid 1950's under various ownership (Attachment B). Construction plans for the gas station indicate the presence of three (3) UST's, a used oil tank, grease pits, brake and battery workbenches, and tire storage (see enclosed Plan envelope). Other historical descriptions of the site include notes on "vulcanizing equipment" for B.F. Goodrich tire distribution, and a "large assortment of fuels and lubricating oils".

As a result of the information available about the gas station, the TPCHD contracted with Transglobal Environmental Geosampling (TEG) to construct four (4) monitoring wells. Groundwater flow direction in the area of the park is to the east-northeast, as shown in groundwater studies completed for contamination remedial activities at the University of Washington Tacoma and the historical museum. The park wells were located (Figure 3) to determine if there was a contamination source upgradient from the park (SP-1 and SP-2) and museum (SP-3), and to determine if contamination was originating from the park area (SP-4). The monitoring wells were constructed on June 22, 2000. Soil and groundwater samples were taken at the time of well construction. Monitoring well SP-2

was constructed just west of the apparent location of one former UST tank. Monitoring well SP-3 was constructed just west of a former Northern Pacific Transport garage located at the south end of what is now the museum parking lot. SP-3 is located just west of the limit of soil excavated for contamination cleanup at the history museum.

Soil and groundwater sample results are included in Attachment C.

Discussion

Based on the data collected from the wells, University of Washington remediation reports, and the Historical Museum data, it appears that the source of contamination is coming from Pugnetti Park.

Monitoring well SP-1 does not indicate any contamination coming from a direction upgradient from the park.

Monitoring well SP-2, while indicating the presence of gasoline, is located adjacent to the park's old UST site location and is probably detecting residual gasoline from the tank pit area. There are no records of underground storage tanks located on property to the immediate west of the park site. There are also some questions remaining about whether the UST's were actually removed from the park site.

Monitoring well SP-3 indicates the presence of gas and diesel in the soil. There was drill stem refusal at seventeen feet and a groundwater sample was not able to be collected. However, there is no record of underground/aboveground storage tanks located to the immediate west of this site and the well is sited at the west edge of the Northern Pacific Transport garage site. The edge of the site is approximately the site where excavation halted during the remedial activity for the historical museum. Excavation further to the west of the museum during cleanup activities would have resulted in undermining Pacific Avenue, therefore, the excavation was stopped. The probable source of contamination in the soil at this site is residual contaminants from the old Northern Pacific Transport garage.

Monitoring well SP-4 shows the presence of a significant amount of petroleum contamination. SP-4 is immediately downgradient of the park UST's, fuel islands, and repair facility where it appears floor drains were directed out of the garage interior (see Service Station Plan). Levels of petroleum contamination are much higher at this well than any well located upgradient of the park.

Based on the information gathered to this date, it is the determination of the TPCHD that the source of petroleum contamination is from somewhere within the park boundary.

Recommendation

Further investigative efforts by the DOT should take place to locate the source of contamination at this site. The TPCHD is aware of a magnetic survey completed at this site. However, there is some question by Mr. Warren about the methodology and timing. An additional survey should be conducted for this site. A survey plan should be

forwarded and approved by Ecology, and a representative from Ecology should be present during the survey.

If additional investigative work and related remediation is not completed by the DOT, it is the recommendation of the TPCHD that the SHA ranking process be completed for this site.



Figure 1

Attachment A



City of Tacoma
Utility Services Laboratory

Memorandum

TO: Troy Naccarato, Water Quality Representative

FROM: Christopher L. Getchell, Source Control Supervisor

SUBJECT: Stormwater Investigation WO# AK80D1

DATE: August 11, 1999

Attached are the sample analysis results for the stormwater sample collected from the manhole at 21st & Ct. A leading into Outfall 235 on July 23, 1999. A Trip Blank was collected with this sample for Volatile Organics.

The sample was analyzed entirely by the Utility Services Laboratory. No major analytical problems were encountered during the analysis of this sample. A detailed Quality Control Data Review report was prepared and is available for review upon request.

If you have any questions concerning this data, call me at (253)502-2130.

Christopher L. Getchell
Source Control Supervisor,
Utility Services Laboratory.

RECEIVED
FEB 07 2000
Tacoma-Pierce County
Health Department

CLG:LAZ

- City of Tacoma -
Utility Services Laboratory

To: Christopher L. Getchell, Source Control Supervisor

Stormwater Investigation

AK80D1MMD

Date: August 11, 1999

Lab#: 990726137

Sample ID: 21st & Ct. A Manhole (*Infiltrate*) MH 447

Sample Type: Stormwater

Sample Date: 07/23/99

	Test	Result	Units
GC/MS-TPH	WTPH-Diesel	0.25 U	mg/L
	WTPH-Heavy Oil	0.50 U	mg/L
GC/MS-VOA	1,1,1-Trichloroethane	10 U	ug/L
	1,1,2,2-Tetrachloroethane	10 U	ug/L
	1,1,2-Trichloroethane	10 U	ug/L
	1,1-Dichloroethene	10 U	ug/L
	1,2-Dichlorobenzene	10 U	ug/L
	1,2-Dichloroethane	10 U	ug/L
	1,2-Dichloropropane	10 U	ug/L
	1,3-Dichlorobenzene	110 U	ug/L
	1,4-Dichlorobenzene	10 U	ug/L
	2-Butanone	100 U	ug/L
	2-Hexanone	100 U	ug/L
	4-Methyl-2-pentanone	100 U	ug/L
	Acetone	100 U	ug/L
	Acrolein	100 U	ug/L
	Acrylonitrile	100 U	ug/L
	Benzene	240	ug/L

U indicates not detected at the associated value

B indicates the value is greater than the detection limits of the method, however it is lower than the Contract
Required Detection Limits

J indicates the associated value is estimated

UJ indicates not detected at the associated value, however the value should be considered estimated

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Jefferson-Pierce County
Health Department

Lab#: 990726137

Sample ID: 21st & Ct. A Manhole

Sample Type: Stormwater

Sample Date: 07/23/99

Test	Result	Units
Bromodichloromethane	10 U	ug/L
Bromoform	10 U	ug/L
Bromomethane	10 U	ug/L
Carbon Disulfide	10 U	ug/L
Carbon Tetrachloride	10 U	ug/L
Chlorobenzene	10 U	ug/L
Chloroethane	10 U	ug/L
Chloroform	10 U	ug/L
Chloromethane	10 U	ug/L
cis 1,3-Dichloropropene	10 U	ug/L
Dibromochloromethane	10 U	ug/L
Ethylbenzene	34	ug/L
Methylene Chloride	10 U	ug/L
Styrene	10 U	ug/L
Tetrachloroethene	10 U	ug/L
Toluene	19	ug/L
total 1,2-Dichloroethene	10 U	ug/L
trans 1,3-Dichloropropene	10 U	ug/L
Trichloroethene	10 U	ug/L
Vinyl Acetate	10 U	ug/L
Vinyl Chloride	10 U	ug/L
WTPH-Gasoline	0.7	mg/L
Xylenes (Total)	60	ug/L

Reviewed By:

Lori A. Zboralski

8/11/99

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Maricopa County
Health Department

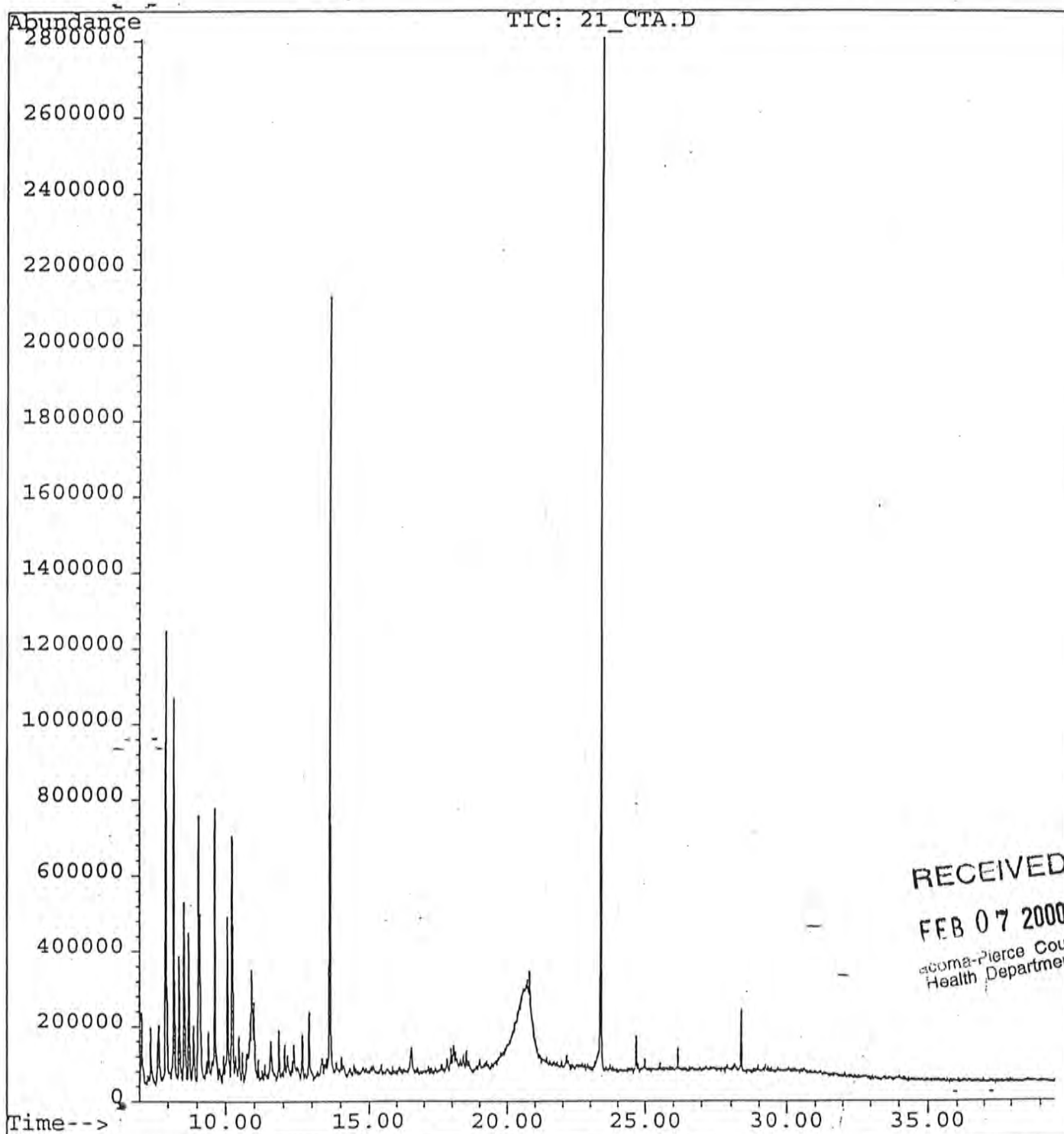
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File : D:\080499D\21_CTA.D
Operator : CROCKETT
Acquired : 4 Aug 99 2:40 pm using AcqMethod D-X
Instrument : 5971SV
Sample Name: 990726137
Misc Info : 21ST ST & CT A MANHOLE
Vial Number: 3



(TV
cc: MTH



City of Tacoma
Utility Services Laboratory

Memorandum

TO: Troy Naccarato, Water Quality Representative
FROM: Christopher L. Getchell, Source Control Supervisor
SUBJECT: Stormwater Investigation WO# AK80D1
DATE: August 10, 1999

Attached are the sample analysis results for the stormwater and sediment samples collected from catch basins near the Washington State Historical Museum leading into Outfall 235 on July 14 and 15, 1999.

The samples were analyzed entirely by the Utility Services Laboratory. No major analytical problems were encountered during the analysis of these samples. A detailed Quality Control Data Review report was prepared and is available for review upon request.

If you have any questions concerning this data, call me at (253)502-2130.

Christopher L. Getchell
Source Control Supervisor,
Utility Services Laboratory.

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Tacoma-Pierce County
Health Department

CLG:LAZ

- City of Tacoma -
Utility Services Laboratory

To: Christopher L. Getchell, Source Control Supervisor

Stormwater Investigation

AK80D1MMD

Date: August 10, 1999

Lab#:	990714094	990714095
Sample ID:	Museum CB Infiltrate	Museum CB
Sample Type:	Stormwater	Stormwater
Sample Date:	07/14/99	07/14/99

Test	Result	Result	Units
GC/MS-TPH			
WTPH-Diesel	0.25 U	0.25 U	mg/L
WTPH-Heavy Oil	0.50 U	0.50 U	mg/L
GC/MS-VOA			
1,1,1-Trichloroethane	10 U		ug/L
1,1,2,2-Tetrachloroethane	10 U		ug/L
1,1,2-Trichloroethane	10 U		ug/L
1,1-Dichloroethene	10 U		ug/L
1,2-Dichlorobenzene	10 U		ug/L
1,2-Dichloroethane	10 U		ug/L
1,2-Dichloropropane	10 U		ug/L
1,3-Dichlorobenzene	10 U		ug/L
1,4-Dichlorobenzene	10 U		ug/L
2-Butanone	100 U		ug/L
2-Hexanone	100 U		ug/L
4-Methyl-2-pentanone	100 U		ug/L
Acetone	100 U		ug/L
Acrolein	100 U		ug/L
Acrylonitrile	100 U		ug/L
Benzene	29		ug/L

U indicates not detected at the associated value

B indicates the value is greater than the detection limits of the method, however it is lower than the Contract Required Detection Limits

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UJ indicates not detected at the associated value, however the value should be considered estimated

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 Tacoma-Pierce Co
 Health Department

Stormwater Investigation

AK80D1MMD

Date: August 10, 1999

Lab#:	990714094	990714095
Sample ID:	Museum CB Infiltrate	Museum CB
Sample Type:	Stormwater	Stormwater
Sample Date:	07/14/99	07/14/99

Test	Result	Result	Units
Bromodichloromethane	10 U		ug/L
Bromoform	10 U		ug/L
Bromomethane	10 U		ug/L
Carbon Disulfide	10 U		ug/L
Carbon Tetrachloride	10 U		ug/L
Chlorobenzene	10 U		ug/L
Chloroethane	10 U		ug/L
Chloroform	10 U		ug/L
Chloromethane	10 U		ug/L
cis 1,3-Dichloropropene	10 U		ug/L
Dibromochloromethane	10 U		ug/L
Ethylbenzene	10 U		ug/L
Methylene Chloride	10 U		ug/L
Styrene	10 U		ug/L
Tetrachloroethene	10 U		ug/L
Toluene	10 U		ug/L
total 1,2-Dichloroethene	10 U		ug/L
trans 1,3-Dichloropropene	10 U		ug/L
Trichloroethene	10 U		ug/L
Vinyl Acetate	10 U		ug/L
Vinyl Chloride	10 U		ug/L
WTPH-Gasoline	0.6		mg/L
Xylenes (Total)	12		ug/L

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Health Department

Stormwater Investigation

AK80D1MMD

Date: August 10, 1999

Lab#:	990714094	990714095
Sample ID:	Museum CB Infiltrate	Museum CB
Sample Type:	Stormwater	Stormwater
Sample Date:	07/14/99	07/14/99

Test	Result	Result	Units
------	--------	--------	-------

Reviewed By: Lori A. Zboralski 8/10/99

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Tacoma-Pierce Coun
Health Department

- City of Tacoma -
Utility Services Laboratory

To: Christopher L. Getchell, Source Control Supervisor

Stormwater Investigation

AK80D1MMD

Date: August 10, 1999

Lab#:	990715102	990715103	
Sample ID:	Museum CB	Museum CB-2N	
Sample Type:	Sediment	Sediment	
Sample Date:	07/15/99	07/15/99	
Test	Result	Result	Units
CONVENTIONAL			
Solids	63.1	69.5	per cent
GC/MS-TPH			
WTPH-Diesel	250 U	250 U	mg/Kg
WTPH-Heavy Oil	1100	800	mg/Kg
GC/MS-VOA			
1,1,1-Trichloroethane	500 U		ug/Kg
1,1,2,2-Tetrachloroethane	500 U		ug/Kg
1,1,2-Trichloroethane	500 U		ug/Kg
1,1-Dichloroethane	500 U		ug/Kg
1,1-Dichloroethene	500 U		ug/Kg
1,2-Dichlorobenzene	500 U		ug/Kg
1,2-Dichloroethane	500 U		ug/Kg
1,2-Dichloropropane	500 U		ug/Kg
1,3-Dichlorobenzene	500 U		ug/Kg
1,4-Dichlorobenzene	500 U		ug/Kg
2-Butanone	5000 U		ug/Kg
2-Hexanone	5000 U		ug/Kg
4-Methyl-2-pentanone	5000 U		ug/Kg
Acetone	5000 U		ug/Kg

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 Tacoma-Pierce
 Health Dept.

Stormwater Investigation

AK80D1MMD

Date: August 10, 1999

Lab#:	990715102	990715103
Sample ID:	Museum CB	Museum CB-2N
Sample Type:	Sediment	Sediment
Sample Date:	07/15/99	07/15/99

Test	Result	Result	Units
Acrolein	500 U		ug/Kg
Acrylonitrile	500 U		ug/Kg
Benzene	500 U		ug/Kg
Bromodichloromethane	500 U		ug/Kg
Bromoform	500 U		ug/Kg
Bromomethane	500 U		ug/Kg
Carbon Disulfide	500 U		ug/Kg
Carbon Tetrachloride	500 U		ug/Kg
Chlorobenzene	500 U		ug/Kg
Chloroethane	500 U		ug/Kg
Chloroform	500 U		ug/Kg
Chloromethane	500 U		ug/Kg
cis 1,3-Dichloropropene	500 U		ug/Kg
Dibromochloromethane	500 U		ug/Kg
Ethylbenzene	500 U		ug/Kg
Methylene Chloride	500 U		ug/Kg
Styrene	500 U		ug/Kg
Tetrachloroethene	500 U		ug/Kg
Toluene	500 U		ug/Kg
total 1,2-Dichloroethene	500 U		ug/Kg
trans 1,3-Dichloropropene	500 U		ug/Kg
Trichloroethene	500 U		ug/Kg
Vinyl Acetate	500 U		ug/Kg
Vinyl Chloride	500 U		ug/Kg

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Tacoma-Pierce
Health Depart.

Stormwater Investigation

AK80D1MMD

Date: August 10, 1999

Lab#:	990715102	990715103
Sample ID:	Museum CB	Museum CB-2N
Sample Type:	Sediment	Sediment
Sample Date:	07/15/99	07/15/99

Test	Result	Result	Units
WTPH-Gasoline	10		mg/Kg
Xylenes (Total)	500 U		ug/Kg

Reviewed By: Lori A. Zgoralski 8/10/99

U indicates not detected at the associated value

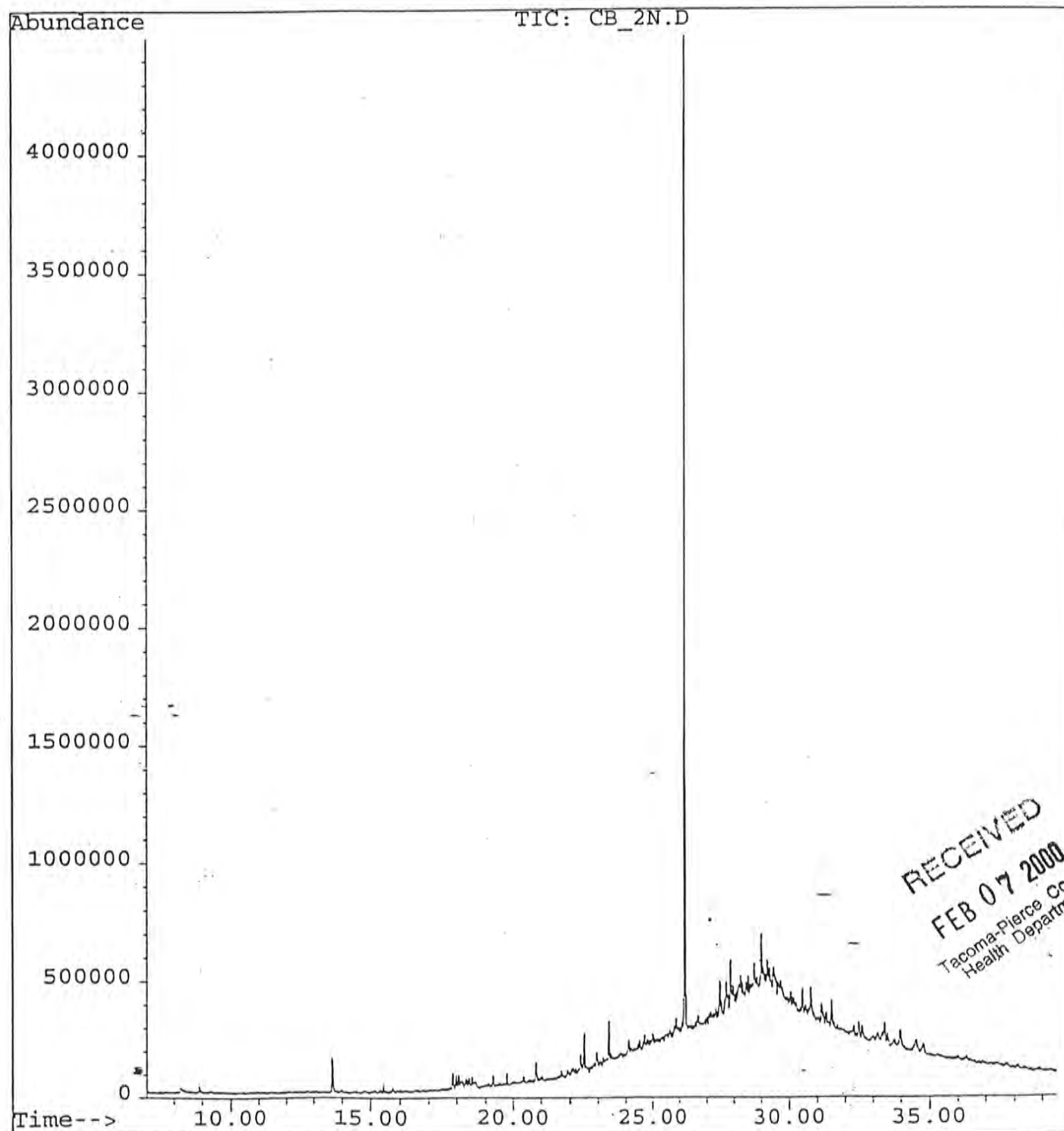
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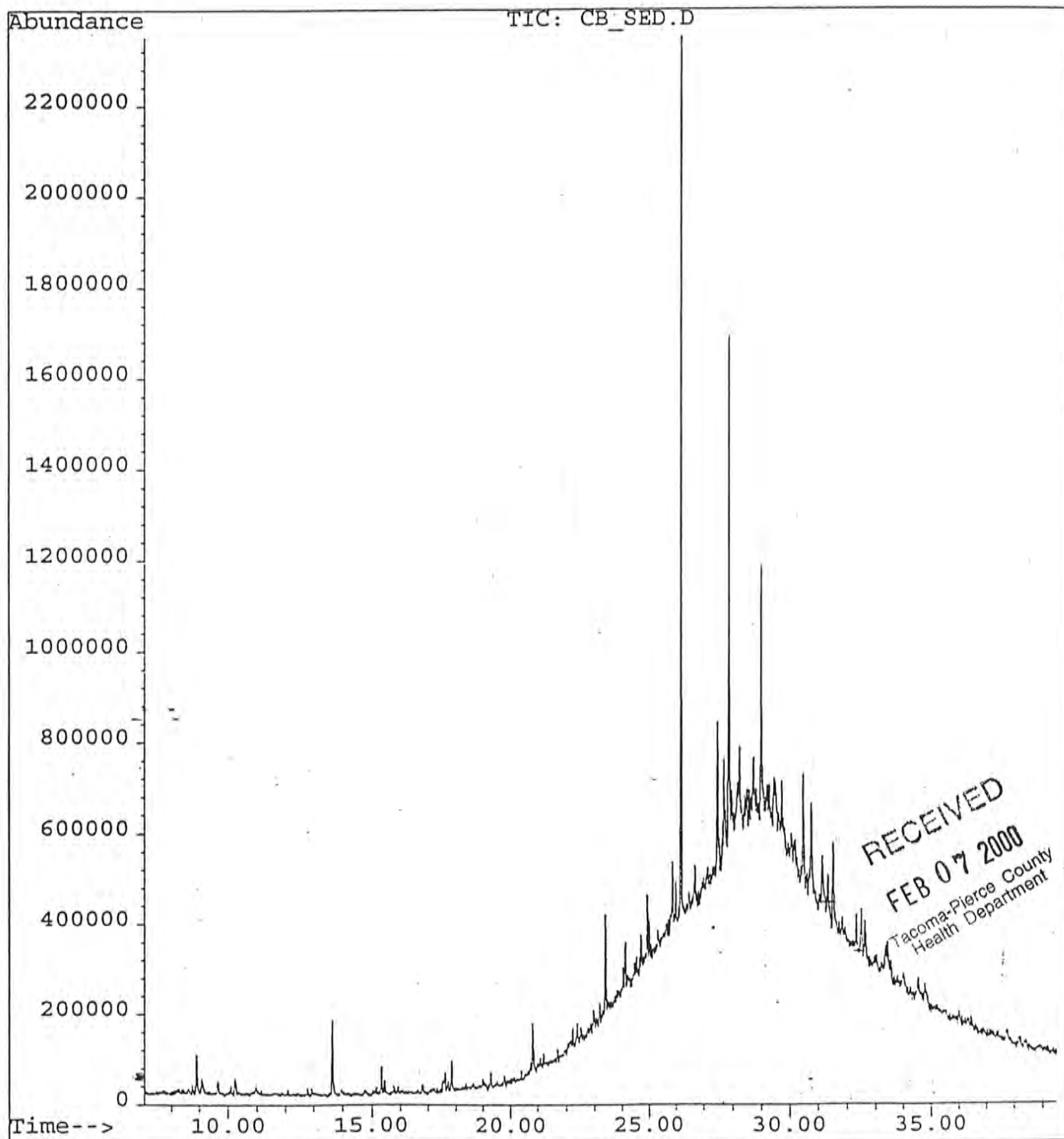
UJ indicates not detected at the associated value, however the value should be considered estimated

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Tacoma-Pierce County
Health Department

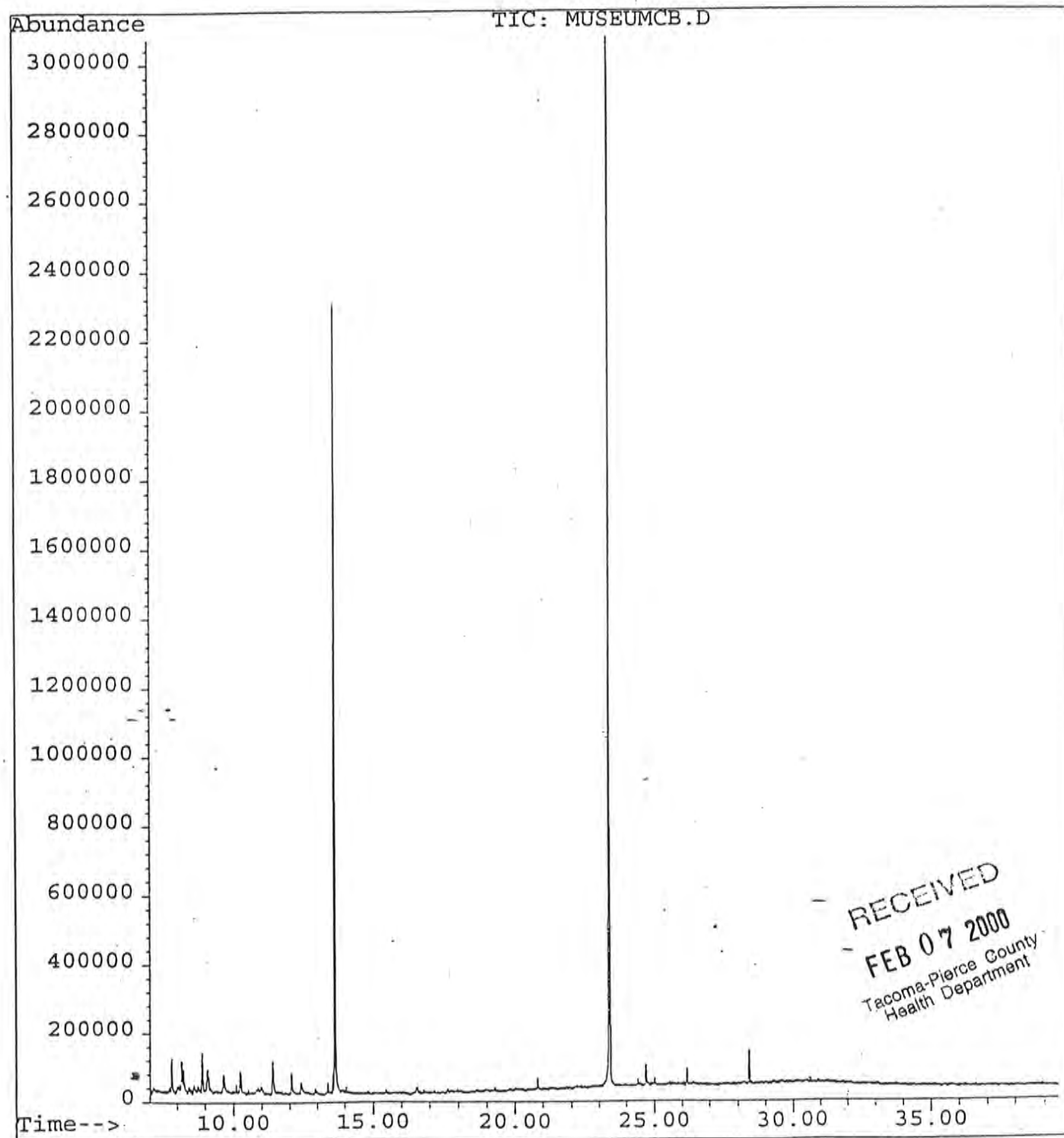
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Operator : CROCKETT
Acquired : 26 Jul 99 10:43 pm using AcqMethod D-X
Instrument : 5971SV
Sample Name: 990715103
Misc Info : MUSEUM CB-2N SED 1/10 DIL
Vial Number: 10



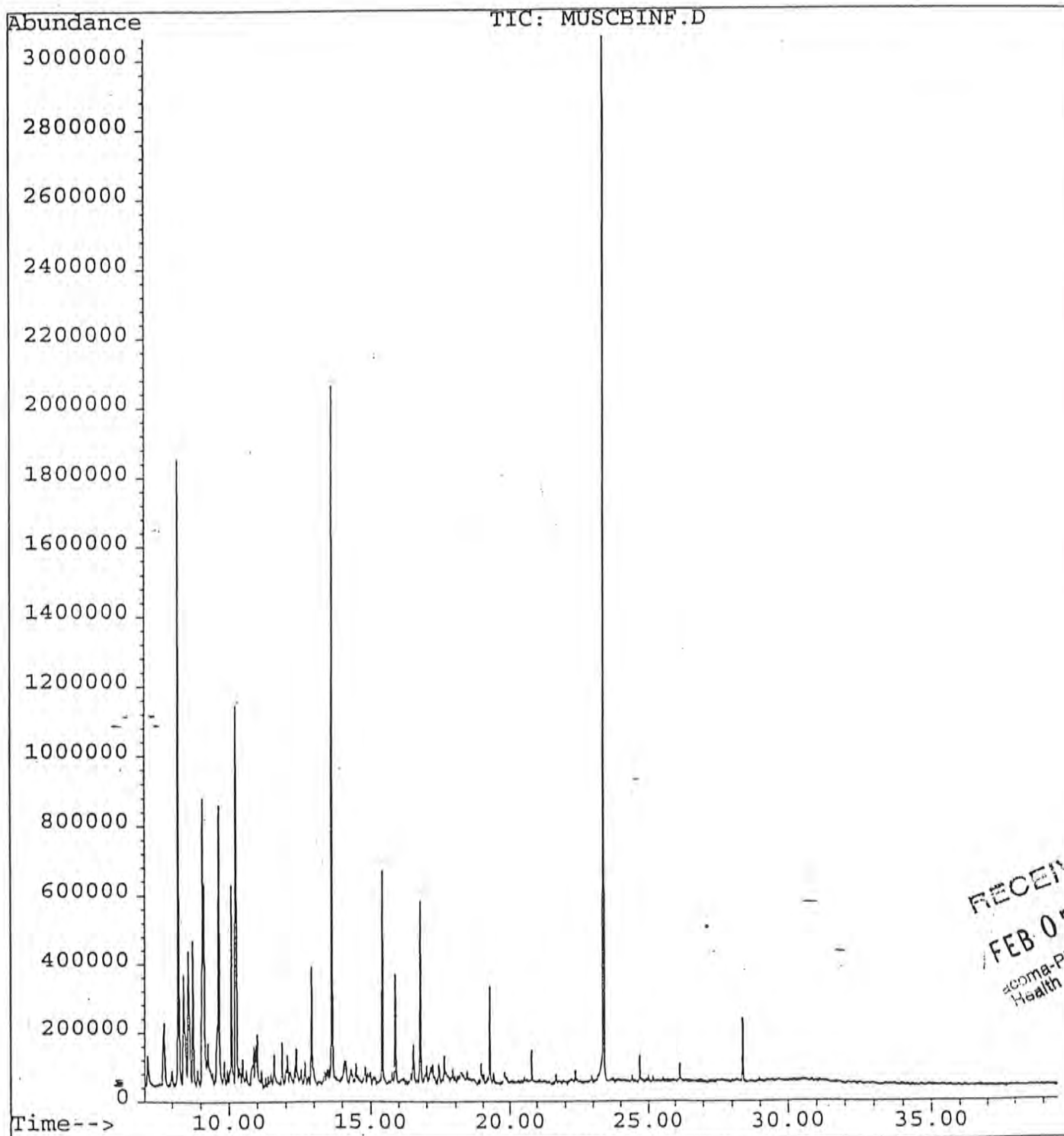
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Operator : CROCKETT
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Instrument : 5971SV
Sample Name: 990715102
Misc Info : MUSEUM CB SED 1/10 DIL
Vial Number: 8



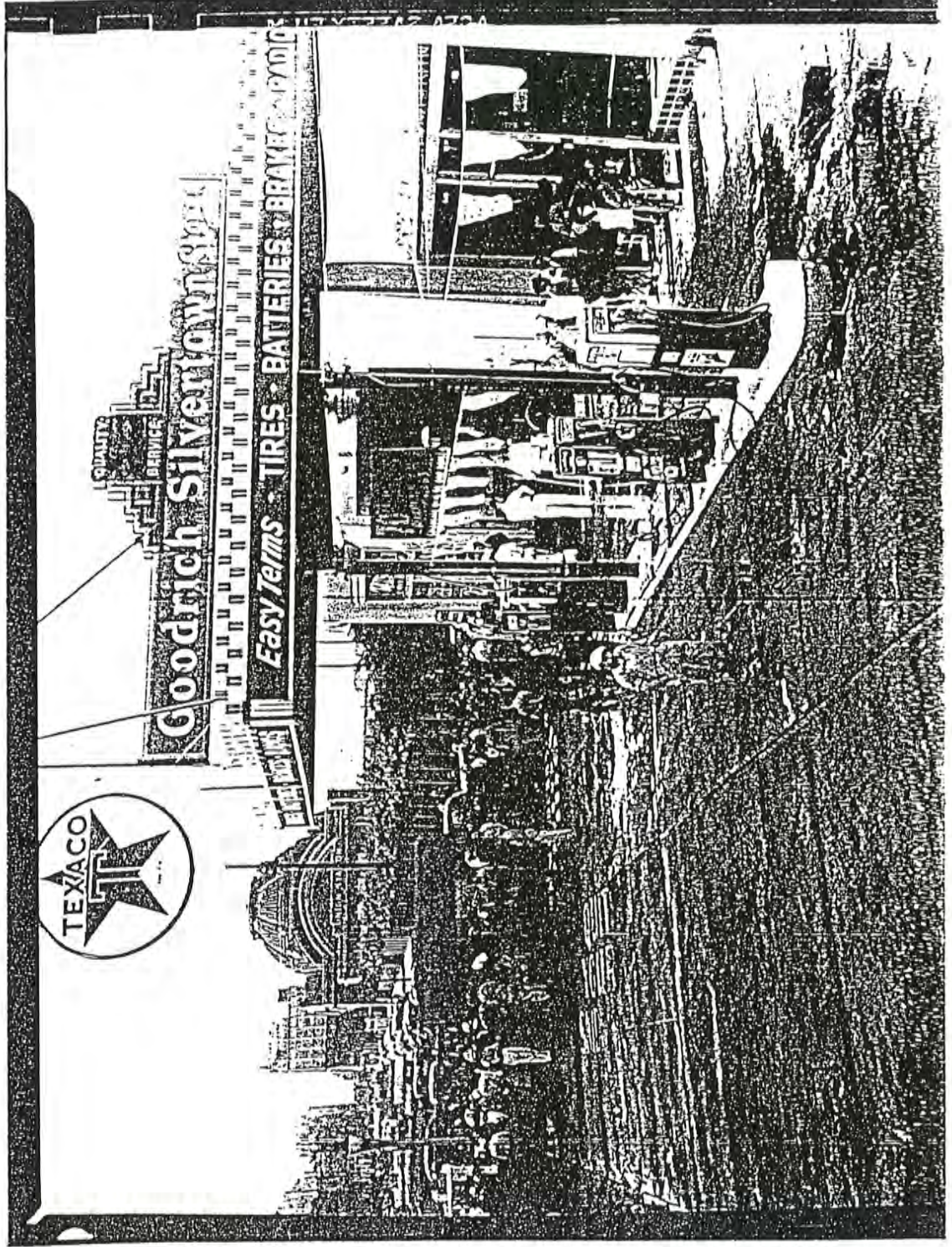
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Operator : CROCKETT
Acquired : 26 Jul 99 6:07 pm using AcqMethod D-X
Instrument : 5971SV
Sample Name: 990714095
Misc Info : MUSEUM CB A WW
Vial Number: 6



File : D:\072699D\MUSCBINF.D
Operator : CROCKETT
Acquired : 26 Jul 99 5:21 pm using AcqMethod D-X
Instrument : 5971SV
Sample Name: 990714094
Misc Info : MUSEUM CB INFILTRATE WW
Vial Number: 5



Attachment B



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Attachment C

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

MUSEUM PROJECT
Tacoma, Washington
Tacoma/Pierce Co. Health Dept.

Analyses of Diesel & Oil (NWTPH-Dx/Dx Extended) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (mg/kg)	Oil (mg/kg)
Method Blank	6/23/00	97	nd	nd
SP-4-16	6/23/00	int	630	nd
SP-4-19	6/23/00	104	220	nd
SP-2-14	6/23/00	103	nd	nd
SP-2-19	6/23/00	97	nd	nd
SP-1-16	6/23/00	101	nd	nd
SP-3-17	6/23/00	120	490	nd
Method Detection Limits			20	40

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 65% TO 135%

ANALYSES PERFORMED BY: Tim McCall

DATA REVIEWED BY: Sherry Chilcutt

RECEIVED
JUL 13 2000
Tacoma-Pierce County
Health Dept.

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

MUSEUM PROJECT
Tacoma, Washington
Tacoma/Pierce Co. Health Dept.

Analyses of Gasoline (NWTPH-Gx) & BTEX (EPA Method 8021B) in Soil

Sample Number	Date Analyzed	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Gasoline (mg/kg)	Surrogate Recovery (%)
Method Blank	6/23/00	nd	nd	nd	nd	nd	119
SP-4-16	6/23/00	21	9.8	37	190	1700	123
SP-4-19	6/23/00	0.21	0.61	1.6	3.4	150	82
SP-2-14	6/23/00	nd	nd	nd	nd	nd	95
SP-2-19	6/23/00	nd	nd	nd	nd	nd	105
SP-1-16	6/23/00	0.06	0.10	0.40	1.6	nd	108
SP-3-17	6/23/00	nd	0.06	0.3	1.8	18	75
Method Detection Limits		0.05	0.05	0.05	0.05	10	

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65% TO 135%

ANALYSES PERFORMED BY: Tim McCall

DATA REVIEWED BY: Sherry Chilcutt

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

MUSEUM PROJECT

Tacoma, Washington

Tacoma/Pierce Co. Health Dept.

Analyses of Diesel & Oil (NWTPH-Dx/Dx Extended) in Water

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (ug/l)	Oil (ug/l)
Method Blank	6/23/00	107	nd	nd
SP-4-W	6/23/00	107	37000	nd
SP-2-W	6/23/00	84	nd	nd
SP-1-W	6/23/00	128	nd	nd
Method Detection Limits			200	400

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 65% TO 135%

ANALYSES PERFORMED BY: Tim McCall

DATA REVIEWED BY: Sherry Chilcutt

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

MUSEUM PROJECT
Tacoma, Washington
Tacoma/Pierce Co. Health Dept.

Analyses of Gasoline (NWTPH-Gx) & BTEX (EPA Method 8021B) in Water

Sample Number	Date Analyzed	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Xylenes (ug/l)	Gasoline (ug/l)	Surrogate Recovery (%)
Method Blank	6/23/00	nd	nd	nd	nd	nd	80
SP-4-W	6/23/00	420	570	1400	6900	46000	120
SP-2-W	6/23/00	32	89	230	24	3500	120
SP-1-W	6/23/00	nd	nd	nd	nd	nd	93
Method Detection Limits		1	1	1	1	100	

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65% TO 135%

ANALYSES PERFORMED BY: Tim McCall

DATA REVIEWED BY: Sherry Chilcutt

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES NORTHWEST, INC.

MUSEUM PROJECT
Tacoma, Washington
Pierce County Health Department

Heavy Metals in Soil by EPA-7000 Series

Sample Number	Date Analyzed	Lead (Pb)	Cadmium (Cd)	Chromium (Cr)	Arsenic (As)	Silver (Ag)	Barium (Ba)	Selenium (Se)	Mercury (Hg)
		EPA 7420 (mg/kg)	EPA 7130 (mg/kg)	EPA 7190 (mg/kg)	EPA 7061 (mg/kg)	EPA 7760 (mg/kg)	EPA 7080 (mg/kg)	EPA 7741 (mg/kg)	EPA 7471 (mg/kg)
Method Blank	6/28/00	nd	nd	nd	nd	nd	nd	nd	nd
SP-1-16	6/28/00	nd	nd	nd	nd	nd	nd	nd	nd
SP-2-14	6/28/00	nd	nd	nd	nd	nd	nd	nd	nd
SP-2-19	6/28/00	nd	nd	nd	nd	nd	nd	nd	nd
SP-3-17	6/28/00	nd	nd	nd	nd	nd	nd	64	nd
SP-4-16	6/28/00	nd	nd	nd	nd	nd	nd	52	nd
SP-4-19	6/28/00	nd	nd	nd	nd	nd	nd	nd	nd
Method Detection Limits		5	1	20	5	20	20	20	0.1

"nd" Indicates not detected at listed detection limits.

ANALYSES PERFORMED BY: Tim McCall
DATA REVIEWED BY: Sherry Chilcutt

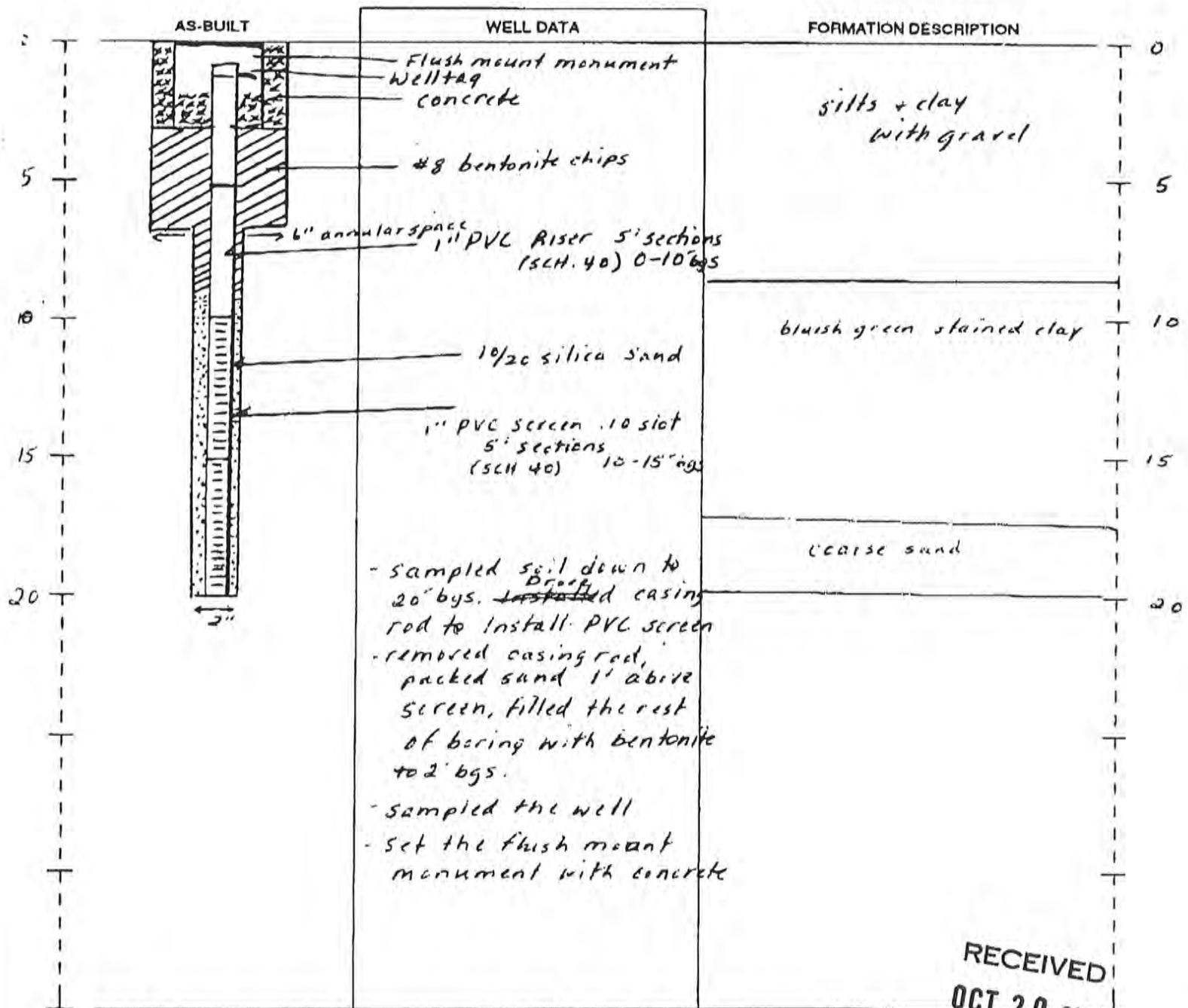
SP-2

RESOURCE PROTECTION WELL REPORT

START CARD NO. 42944

PROJECT NAME: _____
 WELL IDENTIFICATION NO. AFK 210
 DRILLING METHOD: _____
 DRILLER: _____
 FIRM: _____
 SIGNATURE: _____
 CONSULTING FIRM: _____
 REPRESENTATIVE: _____

COUNTY: _____
 LOCATION: 1/4 1/4 Sec Twn R
 STREET ADDRESS OF WELL: _____
 WATER LEVEL ELEVATION: _____
 GROUND SURFACE ELEVATION: _____
 INSTALLED: _____
 DEVELOPED: _____



SCALE: 1" = _____

PAGE 2 OF 4

ECY 050-12 (Rev. 11/89)

ST. PLANE COORDINATES

X = 1159534.35238

Y = 702479.18408

RECEIVED
 OCT 20 2000
 TPCHD.

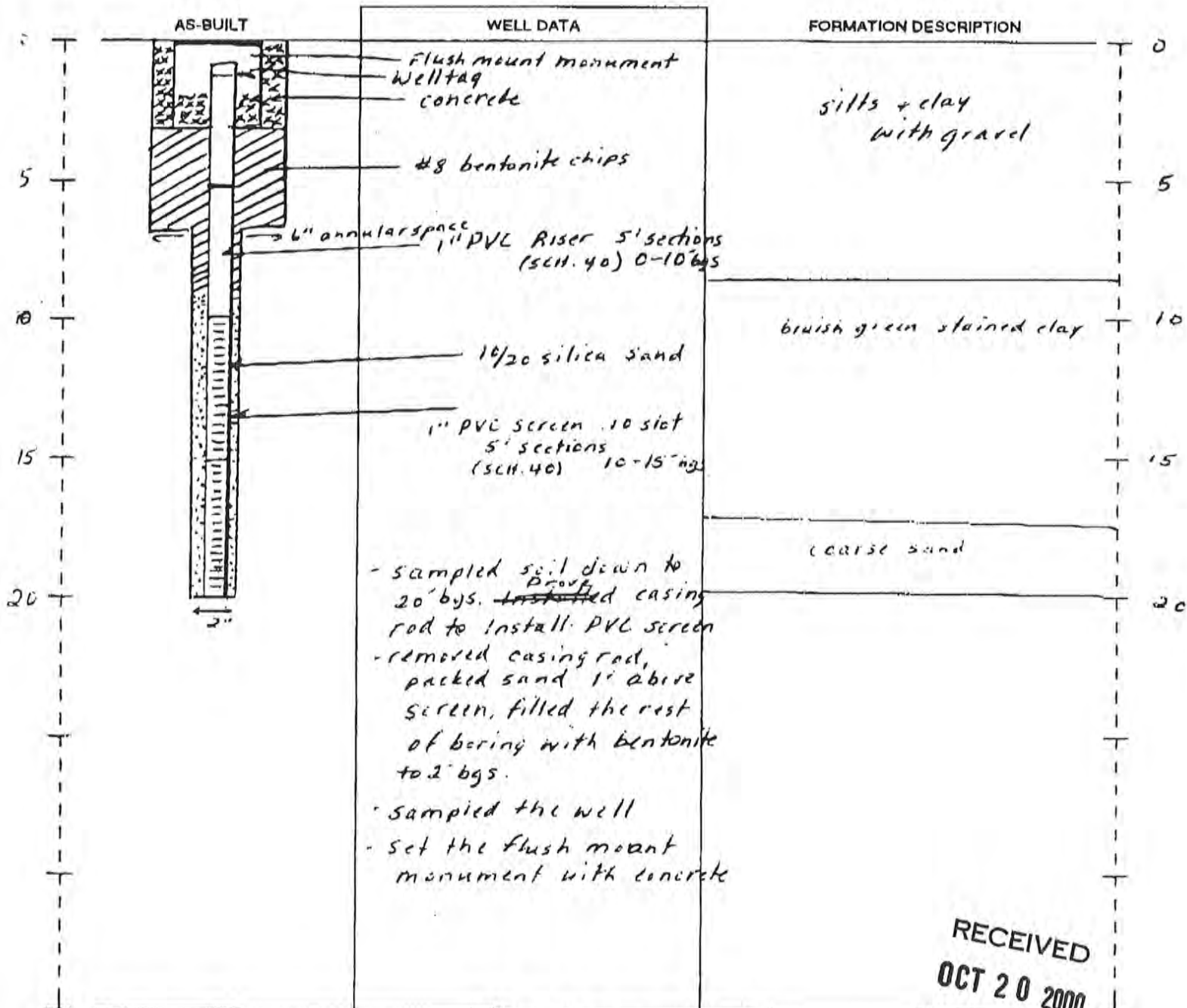
SP-3

RESOURCE PROTECTION WELL REPORT

START CARD NO. 42944

PROJECT NAME: _____
 WELL IDENTIFICATION NO. AFK180
 DRILLING METHOD: _____
 DRILLER: _____
 FIRM: _____
 SIGNATURE: _____
 CONSULTING FIRM: _____
 REPRESENTATIVE: _____

COUNTY: _____
 LOCATION: 1/4 1/4 Sec Twn R
 STREET ADDRESS OF WELL: _____
 WATER LEVEL ELEVATION: _____
 GROUND SURFACE ELEVATION: _____
 INSTALLED: _____
 DEVELOPED: _____



SCALE: 1" = _____

PAGE 3 OF 4

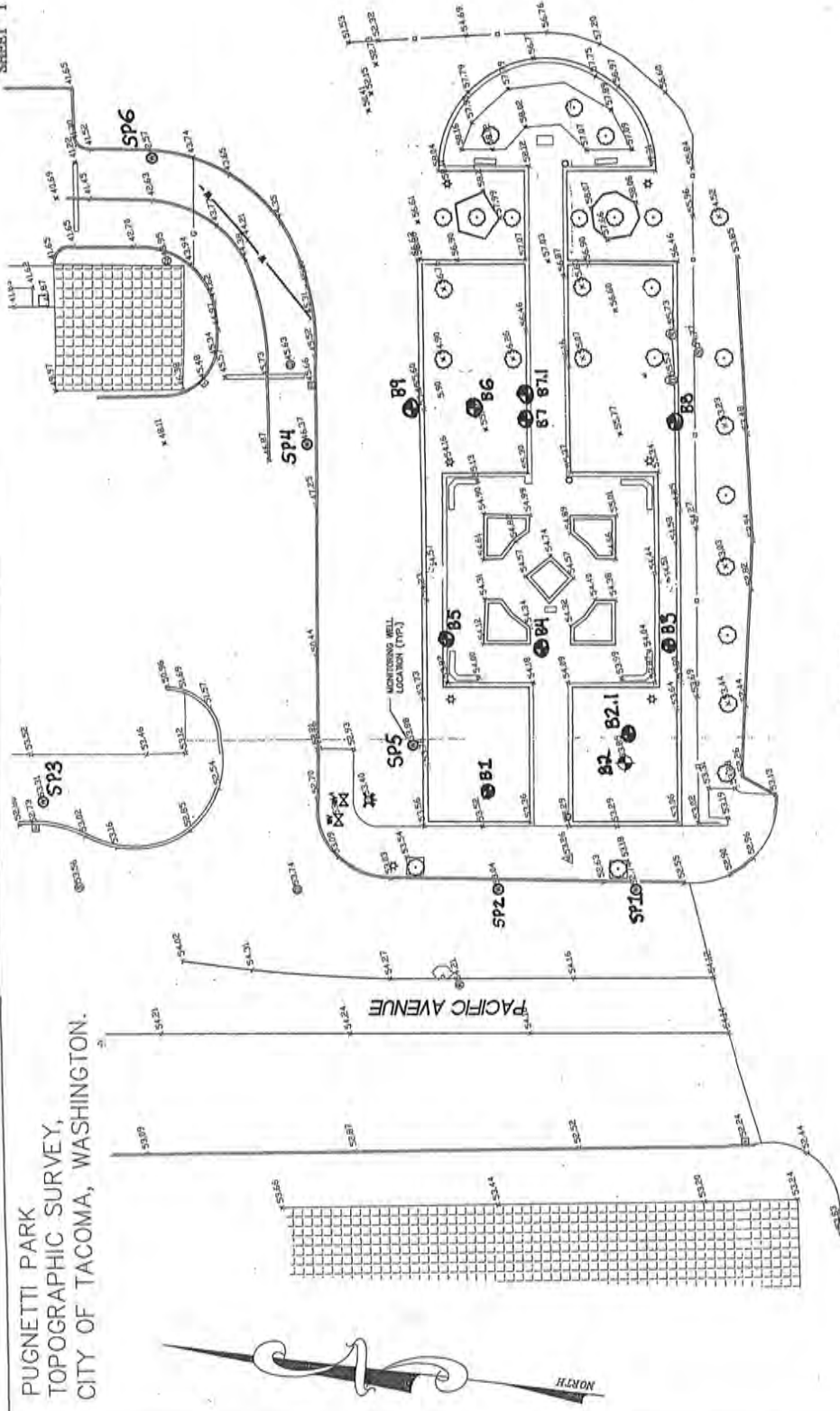
ECY 050-12 (Rev. 11/89)

ST. PLANE COORDINATES
 X = 1159546.72504
 Y = 702601.50015

RECEIVED
 OCT 20 2000
 TPCHD.

APPENDIX F

PUGNETTI PARK
TOPOGRAPHIC SURVEY,
CITY OF TACOMA, WASHINGTON.



GRAPHIC SCALE



EQUIPMENT USED
3" TOTAL STATION WITH TYPICAL FIELD TRAVERSE
METHODS FOR CONTROL AND STATIONING.

BASIS OF BEARING
WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE
(NAD 83/91), PER CITY OF TACOMA SURVEY MONUMENT
DATABASE.

VERTICAL DATUM
CITY OF TACOMA SURVEY MONUMENT DATABASE, NGVD 29.

LEGEND

- BORE HOLE LOCATION
- MONITORING WELL
- TRASH CAN
- LIGHT POLE
- ECOLOGICAL TREE
- SANITARY SERIES MANHOLE
- STORM MANHOLE
- FIRE HYDRANT



AHBL
TACOMA - SEATTLE
2215 North 30th Street, Suite 301, Tacoma, WA 98403
253.252.7171
253.252.7172
205.977.4452 TEL
205.977.4452 TEL

Civil Engineers
Structural Engineers
Landscape Architects
Community Planners
Land Surveyors
Neighborhood

7/1/04

APPENDIX G



Environmental
Services Network

RECEIVED

MAY 05 2003

Washington State
Department of Ecology

May 1, 2003

Joyce Mercuri
Department of Ecology – SW Region
P.O. Box 47775
Olympia, WA 98504-7775

Dear Ms. Mercuri:

Please find enclosed the analytical data report for the Pugnetti Park Project in Tacoma, Washington. Direct Push services were conducted on April 1 & 2, 2003. Soil and water samples were analyzed for Diesel and Oil by NWTPH-Dx/Dx Extended, Gasoline by NWTPH-Gx, BTEX by Method 8021B, VOC's by Method 8260, Semi-VOC's by Method 8270, Total Pb by Methods 7420 & 6020, and Dissolved Pb by Method 6020 on April 4 – 24, 2003.

The results of these analyses are summarized in the attached tables. All soil values are reported on a dry weight basis. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

ESN Northwest appreciates the opportunity to have provided geosampling and analytical services to the Department of Ecology for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Michael A. Korosec
President

ESN NORTHWEST CHEMISTRY LABORATORY

PUGNETTI PARK PROJECT

Washington

Department of Ecology

Client Project #JIB29

Analyses of Diesel & Oil (NWTPH-Dx/Dx Extended) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (mg/kg)	Oil (mg/kg)	Mineral Oil (mg/kg)
Method Blank	4/7/03	98	nd	nd	nd
Method Blank	4/8/03	107	nd	nd	nd
SP6-S-12	4/7/03	126	230	nd	nd
B1-S-16	4/7/03	93	nd	nd	nd
B2.1-12	4/7/03	104	nd	nd	nd
B3-20	4/7/03	94	nd	nd	nd
B4-16	4/7/03	105	150	nd	nd
B5-12	4/7/03	96	nd	nd	nd
B5-12 Dup.	4/8/03	107	nd	nd	nd
B6-18	4/7/03	83	nd	nd	nd
B7.1-20	4/7/03	116	83	380	nd
B7.1-20-D	4/7/03	107	52	210	nd
B8-26	4/7/03	78	nd	nd	nd
Method Detection Limits			20	40	40

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 65% TO 135%

ANALYSES PERFORMED BY: Marilyn Farmer & Dean Phillips

ESN NORTHWEST CHEMISTRY LABORATORY

PUGNETTI PARK PROJECT

Washington

Department of Ecology

Client Project #JIB29

Analyses of Gasoline (NWTPH-Gx) & BTEX (EPA Method 8021B) in Soil

Sample Number	Date Analyzed	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Gasoline (mg/kg)	Surrogate Recovery (%)
Method Blank	4/7/03	nd	nd	nd	nd	nd	73
LCS	4/7/03	98%	102%	---	---	---	105
SP6-S-12	4/7/03	0.20	0.37	2.4	5.5	180	83
B1-S-16	4/7/03	0.74	0.47	1.7	7.6	160	78
B2.1-12	4/7/03	2.9	6.6	21	170	1900	97
B3-20	4/7/03	0.93	0.67	3.3	12	140	93
B4-16	4/7/03	10	24	41	190	2800	124
B5-12	4/7/03	nd	nd	nd	nd	nd	87
B5-12 Dup	4/7/03	nd	nd	nd	nd	nd	70
B5-12 MS	4/7/03	90%	86%	---	---	---	72
B6-18	4/7/03	nd	nd	nd	nd	nd	75
B7.1-20	4/7/03	0.85	0.20	0.52	nd	150	80
B7.1-20-D	4/7/03	1.0	0.18	0.51	nd	96	75
B8-26	4/7/03	3.2	1.8	4.5	16	490	93
Method Detection Limits		0.02	0.05	0.05	0.05	10	

"---" Indicates not tested for component.

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene), LCS and MS: 65% TO 135%

ANALYSES PERFORMED BY: Marilyn Farmer & Dean Phillips

ESN NORTHWEST CHEMISTRY LABORATORY

PUGNETTI PARK PROJECT

Washington

Department of Ecology

Client Project #JIB29

Heavy Metals in Soil by EPA-7000 Series

Sample Number	Date Analyzed	Lead (Pb) EPA 7420 (mg/kg)
Method Blank	4/7/03	nd
B1-S-16	4/7/03	nd
B2.1-12	4/7/03	11
B2.1-12 Dup	4/7/03	13
Method Detection Limits		5

"nd" Indicates not detected at listed detection limits.

ANALYSES PERFORMED BY: Marilyn Farmer & Dean Phillips

ESN NORTHWEST CHEMISTRY LABORATORY

PUGNETTI PARK PROJECT

Washington

Department of Ecology

Client Project #JIB29

QA/QC Data - Total Metals EPA-7000 Series Analyses

Sample Number: E-Comp							
Matrix Spike				Matrix Spike Duplicate			RPD
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)		Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Lead	125	134	107		125	137	110
							2.21

Laboratory Control Sample			
	Spiked Conc. (mg/kg)	Measured Conc. (mg/kg)	Spike Recovery (%)
Lead	125	137	110

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 65%-135%

ACCEPTABLE RPD IS 35%

ANALYSES PERFORMED BY: Marilyn Farmer & Dean Phillips

ESN Job Number: S30423-2
Client: WASHINGTON DEPARTMENT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Analytical Results

8260, µg/kg		MTH BLK	LCS	B1-5-16	B2-1-12	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Date extracted	Reporting	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	
Date analyzed	Limits	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	
Dichlorodifluoromethane	50	nd		nd	nd			
Chloromethane	50	nd		nd	nd			
Vinyl chloride	50	nd		nd	nd			
Bromomethane	50	nd		nd	nd			
Chloroethane	50	nd		nd	nd			
Trichlorofluoromethane	50	nd		nd	nd			
1,1-Dichloroethene	50	nd		nd	nd			
Methylene chloride	20	nd		nd	nd			
trans-1,2-Dichloroethene	50	nd		nd	nd			
1,1-Dichloroethane	50	nd		nd	nd			
cis-1,2-Dichloroethene	50	nd		nd	nd			
2,2-Dichloropropane	50	nd		nd	nd			
Chloroform	50	nd		nd	nd			
Bromochloromethane	50	nd		nd	nd			
1,1,1-Trichloroethane	50	nd		nd	nd			
1,2-Dichloroethane	50	nd		nd	nd			
1,1-Dichloropropene	50	nd		nd	nd			
Carbon tetrachloride	50	nd		nd	nd			
Benzene	20	nd	97%	nd	nd	96%	91%	5%
Trichloroethene	20	nd		nd	nd			
1,2-Dichloropropane	50	nd		nd	nd			
Dibromomethane	50	nd		nd	nd			
Bromodichloromethane	50	nd		nd	nd			
cis-1,3-Dichloropropene	50	nd		nd	nd			
Toluene	50	nd	98%	nd	nd	96%	89%	8%
trans-1,3-Dichloropropene	50	nd		nd	nd			
1,1,2-Trichloroethane	50	nd		nd	nd			
1,3-Dichloropropane	50	nd		nd	nd			
Dibromochloromethane	50	nd		nd	nd			
Tetrachloroethene	20	nd		nd	nd			
1,2-Dibromoethane (EDB)(*)	5	nd		nd	nd			
Chlorobenzene	50	nd		nd	nd			
1,1,1,2-Tetrachloroethane	50	nd		nd	nd			
Ethylbenzene	50	nd		nd	710			
Xylenes	50	nd		200	7,100			
Styrene	50	nd		nd	nd			
Bromoform	50	nd		nd	nd			
1,1,2,2-Tetrachloroethane	50	nd		nd	nd			
Isopropylbenzene	50	nd		nd	320			
1,2,3-Trichloropropane	50	nd		nd	nd			
Bromobenzene	50	nd		nd	nd			
n-Propylbenzene	50	nd		nd	1,700			
2-Chlorotoluene	50	nd		nd	nd			
4-Chlorotoluene	50	nd		nd	nd			
1,3,5-Trimethylbenzene	50	nd		160	3,600			
tert-Butylbenzene	50	nd		nd	nd			
1,2,4-Trimethylbenzene	50	nd		660	17,000			
sec-Butylbenzene	50	nd		nd	360			
1,3-Dichlorobenzene	50	nd		nd	nd			
1,4-Dichlorobenzene	50	nd		nd	nd			
Isopropyltoluene	50	nd		nd	200			
1,2-Dichlorobenzene	50	nd		nd	nd			
n-Butylbenzene	50	nd		nd	nd			
1,2-Dibromo-3-Chloropropane	50	nd		nd	nd			
1,2,4-Trichlorobenzene	50	nd		nd	nd			
Naphthalene	50	nd		250	nd			
Hexachloro-1,3-butadiene	50	nd		nd	nd			
1,2,3-Trichlorobenzene	50	nd		nd	nd			

*-Instrument detection limits

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WASHINGTON DEPARTMENT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Analytical Results

8260, µg/kg		MTH BLK	LCS	B1-5-16	B2-1-12	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Date extracted	Reporting	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	
Date analyzed	Limits	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	04/23/03	

Surrogate recoveries

Dibromofluoromethane	96%	94%	91%	90%	94%	96%
Toluene-d8	99%	100%	99%	98%	102%	98%
4-Bromofluorobenzene	102%	101%	100%	96%	104%	98%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

Acceptable Recovery limits: 65% TO 135%

Acceptable RPD limit: 35%

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WASHINGTON DEPARTMENT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Analytical Results

8270, mg/kg		MTH BLK	LCS	B1-5-16	B2-1-12	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Date extracted	Reporting	04/23/03	04/23/03	04/23/03	04/23/03	04/24/03	04/24/03	
Date analyzed	Limits	04/23/03	04/23/03	04/23/03	04/23/03	04/24/03	04/24/03	
Penachloroethane	0.10	nd		nd	nd			
Bis (2-chloroethyl) ether	0.10	nd		nd	nd			
1,3-Dichlorobenzene	0.10	nd		nd	nd			
1,4-Dichlorobenzene	0.10	nd		nd	nd			
1,2-Dichlorobenzene	0.10	nd		nd	nd			
2-Methylphenol (o-cresol)	0.10	nd		nd	nd			
Bis (2-chloroisopropyl) ether	0.10	nd		nd	nd			
3,4-Methylphenol (m,p-cresol)	0.10	nd		nd	nd			
2-Nitrophenol	0.50	nd		nd	nd			
Bis (2-chloroethoxy) methane	0.10	nd		nd	nd			
1,2,4-Trichlorobenzene	0.10	nd		nd	nd			
Naphthalene	0.10	nd		0.23	1.0			
Hexachloropropylene	0.50	nd		nd	nd			
Hexachlorobutadiene	0.50	nd		nd	nd			
1,2,4,5-Tetrachlorobenzene	0.10	nd		nd	nd			
Hexachlorocyclopentadiene	0.10	nd		nd	nd			
2,4,5-Trichlorophenol	0.50	nd		nd	nd			
2-Chloronaphthalene	0.10	nd		nd	nd			
Dimethylphthalate	0.10	nd		nd	nd			
Acenaphthylene	0.10	nd	93%	nd	nd	96%	114%	17%
Acenaphthene	0.10	nd		nd	nd			
2,4-Dinitrophenol	0.50	nd		nd	nd			
Pentachlorobenzene	0.10	nd		nd	nd			
Fluorene	0.10	nd		nd	nd			
Diethylphthalate	0.50	nd		nd	nd			
4-Chlorophenylphenylether	0.10	nd		nd	nd			
N-Nitrosodiphenylamine	0.10	nd		nd	nd			
4-Bromophenylphenylether	0.10	nd		nd	nd			
Hexachlorobenzene	0.10	nd		nd	nd			
Phenanthrene	0.10	nd		nd	nd			
Anthracene	0.10	nd		nd	nd			
Di-n-butylphthalate	0.10	nd		nd	nd			
Fluoranthene	0.10	nd		nd	nd			
Pyrene	0.10	nd	89%	nd	nd	94%	107%	13%
Butylbenzylphthalate	0.50	nd		nd	nd			
Benzo(a)anthracene	0.10	nd		nd	nd			
Chrysene	0.10	nd	97%	nd	nd	85%	95%	11%
Bis (2-ethylhexyl) ether	0.10	nd		nd	nd			
Di-n-octylphthalate	0.50	nd		nd	nd			
Benzo(b)fluoranthene	0.10	nd		nd	nd			
Benzo(k)fluoranthene	0.10	nd		nd	nd			
Benzo(a)pyrene	0.10	nd		nd	nd			
Dibenzo(a,h)anthracene	0.10	nd		nd	nd			
Benzo(ghi)perylene	0.10	nd		nd	nd			
Indeno(1,2,3-cd)pyrene	0.10	nd		nd	nd			

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WASHINGTON DEPARTMENT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Analytical Results

8270, mg/kg		MTH BLK	LCS	B1-5-16	B2-1-12	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Date extracted	Reporting	04/23/03	04/23/03	04/23/03	04/23/03	04/24/03	04/24/03	
Date analyzed	Limits	04/23/03	04/23/03	04/23/03	04/23/03	04/24/03	04/24/03	

Surrogate recoveries

Nitrobenzene-d5	110%	105%	111%	114%	103%	103%
2-Fluorobiphenyl	100%	96%	99%	101%	95%	93%
4-Terphenyl-d14	93%	91%	92%	96%	87%	85%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

Acceptable Recovery limits: 65% TO 135%

Acceptable RPD limit: 35%

ESN NORTHWEST CHEMISTRY LABORATORY

PUGNETTI PARK PROJECT

Washington

Department of Ecology

Client Project #JIB29

Analyses of Diesel & Oil (NWTPH-Dx/Dx Extended) in Water

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (ug/l)	Oil (ug/l)	Mineral Oil (ug/l)
Method Blank	4/4/03	102	nd	nd	nd
Method Blank	4/7/03	98	nd	nd	nd
SP3-W	4/7/03	113	nd	nd	nd
SP3-W Dup.	4/4/03	92	nd	nd	nd
B1-W	4/4/03	100	nd	nd	nd
SP6-W	4/4/03	97	nd	nd	nd
SP4-W	4/7/03	94	nd	nd	nd
SP4-WD	4/4/03	98	nd	nd	nd
Method Detection Limits			200	400	400

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 65% TO 135%

ANALYSES PERFORMED BY: Marilyn Farmer & Dean Phillips

ESN NORTHWEST CHEMISTRY LABORATORY

PUGNETTI PARK PROJECT

Washington

Department of Ecology

Client Project #JIB29

Analyses of Gasoline (NWTPH-Gx) & BTEX (EPA Method 8021B) in Water

Sample Number	Date Analyzed	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Xylenes (ug/l)	Gasoline (ug/l)	Surrogate Recovery (%)
Method Blank	4/4/03	nd	nd	nd	nd	nd	90
Method Blank	4/7/03	nd	nd	nd	nd	nd	73
LCS	4/4/03	87%	94%	---	---	---	108
SP3-W	4/4/03	nd	nd	nd	nd	nd	98
SP3-W Dup.	4/4/03	nd	nd	nd	nd	nd	104
SP3-W MS	4/7/03	92%	92%	---	---	---	89
B1-W	4/4/03	230	210	930	4,000	46,000	90
SP6-W	4/4/03	140	100	1,300	4,200	35,000	93
SP4-W	4/7/03	150	170	460	2,500	22,000	104
SP4-WD	4/4/03	190	250	760	4,000	28,000	88
Method Detection Limits		1	1	1	1	100	

"---" Indicates not tested for this component.

"nd" Indicates not detected at the listed detection limits.

"inf" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65% TO 135%

ANALYSES PERFORMED BY: Marilyn Farmer & Dean Phillips

STL Seattle

Client Name	ESN Northwest, Inc.
Client ID:	SP6-W
Lab ID:	112957-04
Date Received:	4/8/03
Date Prepared:	4/14/03
Date Analyzed:	4/14/03
Dilution Factor	10

Dissolved Metals by ICP-MS - USEPA Method 6020

Analyte	Result (mg/L)	PQL	Flags
Lead	0.0107	0.005	

STL Seattle

Client Name	ESN Northwest, Inc.
Client ID:	SP6-W
Lab ID:	112957-04
Date Received:	4/8/03
Date Prepared:	4/11/03
Date Analyzed:	4/11/03
Dilution Factor	10

Metals by ICP-MS - USEPA Method 6020

Analyte	Result (mg/L)	PQL	Flags
Lead	0.0164	0.005	

STL Seattle

Client Name	ESN Northwest, Inc.
Client ID:	SP4-W
Lab ID:	112957-05
Date Received:	4/8/03
Date Prepared:	4/14/03
Date Analyzed:	4/14/03
Dilution Factor	10

Dissolved Metals by ICP-MS - USEPA Method 6020

Analyte	Result (mg/L)	PQL	Flags
Lead	ND	0.005	

STL Seattle

Client Name	ESN Northwest, Inc.
Client ID:	SP4-W-D
Lab ID:	112957-06
Date Received:	4/8/03
Date Prepared:	4/14/03
Date Analyzed:	4/14/03
Dilution Factor	10

Dissolved Metals by ICP-MS - USEPA Method 6020

Analyte	Result (mg/L)	PQL	Flags
Lead	ND	0.005	

STL Seattle

Client Name	ESN Northwest, Inc.
Client ID:	SP4-W
Lab ID:	112957-05
Date Received:	4/8/03
Date Prepared:	4/11/03
Date Analyzed:	4/11/03
Dilution Factor	10

Metals by ICP-MS - USEPA Method 6020

Analyte	Result (mg/L)	PQL	Flags
Lead	ND	0.005	

STL Seattle

Client Name	ESN Northwest, Inc.
Client ID:	SP4-W-D
Lab ID:	112957-06
Date Received:	4/8/03
Date Prepared:	4/11/03
Date Analyzed:	4/11/03
Dilution Factor	10

Metals by ICP-MS - USEPA Method 6020

Analyte	Result (mg/L)	PQL	Flags
Lead	ND	0.005	

STL Seattle

Lab ID:	Method Blank - DP609
Date Received:	-
Date Prepared:	4/14/03
Date Analyzed:	4/14/03
Dilution Factor	1

Dissolved Metals by ICP-MS - USEPA Method 6020

Analyte	Result (mg/L)	PQL	Flags
Lead	ND	0.0005	

STL Seattle

Matrix Spike Report

Client Sample ID: SP6-W
Lab ID: 112957-04
Date Prepared: 4/14/03
Date Analyzed: 4/14/03
QC Batch ID: DP609

Dissolved Metals by ICP-MS - USEPA Method 6020

Parameter Name	Sample Result (mg/L)	Spike Amount (mg/L)	MS Result (mg/L)	MS % Rec.	Flag
Lead	0.011	1	1	99	

STL Seattle

Duplicate Report

Client Sample ID: SP6-W
Lab ID: 112957-04
Date Prepared: 4/14/03
Date Analyzed: 4/14/03
QC Batch ID: DP609

Dissolved Metals by ICP-MS - USEPA Method 6020

Parameter Name	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD %	Flag
Lead	0.011	0.011	0.0	

VOC water

ESN Job Number: S30423-2
Client: WA DEPT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Result Duplicate Result

Analytical Results

8260, µg/L		MTH BLK	LCS	4-W	4-WD
Matrix	Water	Water	Water	Water	Water
Date extracted	Reporting	04/24/03	04/24/03	04/24/03	04/24/03
Date analyzed	Limits	04/24/03	04/24/03	04/24/03	04/24/03
Dichlorodifluoromethane	1.0	nd		nd	nd
Chloromethane	1.0	nd		nd	nd
Vinyl chloride	0.2	nd		nd	nd
Bromomethane	1.0	nd		nd	nd
Chloroethane	1.0	nd		nd	nd
Trichlorofluoromethane	1.0	nd		nd	nd
1,1-Dichloroethene	1.0	nd		nd	nd
Methylene chloride	1.0	nd		nd	nd
trans-1,2-Dichloroethene	1.0	nd		nd	nd
1,1-Dichloroethane	1.0	nd		nd	nd
cis-1,2-Dichloroethene	1.0	nd		nd	nd
2,2-Dichloropropane	1.0	nd		nd	nd
Chloroform	1.0	nd		nd	nd
Bromochloromethane	1.0	nd		nd	nd
1,1,1-Trichloroethane	1.0	nd		nd	nd
1,2-Dichloroethane	1.0	nd		nd	nd
1,1-Dichloropropene	1.0	nd		nd	nd
Carbon tetrachloride	1.0	nd		nd	nd
Benzene	1.0	nd	105%	230	200
Trichloroethene	1.0	nd		nd	nd
1,2-Dichloropropane	1.0	nd		nd	nd
Dibromomethane	1.0	nd		nd	nd
Bromodichloromethane	1.0	nd		nd	nd
cis-1,3-Dichloropropene	1.0	nd		nd	nd
Toluene	1.0	nd	107%	420	330
trans-1,3-Dichloropropene	1.0	nd		nd	nd
1,1,2-Trichloroethane	1.0	nd		nd	nd
1,3-Dichloropropane	1.0	nd		nd	nd
Dibromochloromethane	1.0	nd		nd	nd
Tetrachloroethene	1.0	nd		nd	nd
1,2-Dibromoethane (EDB)(*)	0.01	nd		nd	nd
Chlorobenzene	1.0	nd		nd	nd
1,1,1,2-Tetrachloroethane	1.0	nd		nd	nd
Ethylbenzene	1.0	nd		2,200	1,800
Xylenes	1.0	nd		8,700	7,300
Styrene	1.0	nd		nd	nd
Bromoform	1.0	nd		nd	nd
1,1,1,2,2-Tetrachloroethane	1.0	nd		nd	nd
Isopropylbenzene	1.0	nd		68	58
1,2,3-Trichloropropane	1.0	nd		nd	nd
Bromobenzene	1.0	nd		nd	nd
n-Propylbenzene	1.0	nd		190	150
2-Chlorotoluene	1.0	nd		nd	nd
4-Chlorotoluene	1.0	nd		nd	nd
1,3,5-Trimethylbenzene	1.0	nd		520	500
tert-Butylbenzene	1.0	nd		nd	nd
1,2,4-Trimethylbenzene	1.0	nd		2,400	2,300
sec-Butylbenzene	1.0	nd		7.9	7.1
1,3-Dichlorobenzene	1.0	nd		nd	nd
1,4-Dichlorobenzene	1.0	nd		nd	nd
Isopropyltoluene	1.0	nd		5.1	5.3
1,2-Dichlorobenzene	1.0	nd		nd	nd
n-Butylbenzene	1.0	nd		nd	nd
1,2-Dibromo-3-Chloropropane	1.0	nd		nd	nd
1,2,4-Trichlorobenzene	1.0	nd		nd	nd
Naphthalene	1.0	nd		170	220
Hexachloro-1,3-butadiene	1.0	nd		nd	nd
1,2,3-Trichlorobenzene	1.0	nd		nd	nd

*-instrument detection limits

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WA DEPT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Analytical Results

8260, µg/L		MTH BLK	LCS	4-W	4-WD
Matrix	Water	Water	Water	Water	Water
Date extracted	Reporting	04/24/03	04/24/03	04/24/03	04/24/03
Date analyzed	Limits	04/24/03	04/24/03	04/24/03	04/24/03

Surrogate recoveries

Dibromofluoromethane	125%	91%	97%	98%
Toluene-d8	76%	101%	97%	95%
4-Bromofluorobenzene	97%	94%	98%	95%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

#DIV/0!

VOC QC

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WA DEPT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Analytical Results

8260, µg/L		MS	MSD	RPD
Matrix	Water	Water	Water	
Date extracted	Reporting	04/24/03	04/24/03	
Date analyzed	Limits	04/24/03	04/24/03	
Dichlorodifluoromethane	1.0			
Chloromethane	1.0			
Vinyl chloride	0.2			
Bromomethane	1.0			
Chloroethane	1.0			
Trichlorofluoromethane	1.0			
1,1-Dichloroethene	1.0			
Methylene chloride	1.0			
trans-1,2-Dichloroethene	1.0			
1,1-Dichloroethane	1.0			
cis-1,2-Dichloroethene	1.0			
2,2-Dichloropropane	1.0			
Chloroform	1.0			
Bromochloromethane	1.0			
1,1,1-Trichloroethane	1.0			
1,2-Dichloroethane	1.0			
1,1-Dichloropropene	1.0			
Carbon tetrachloride	1.0			
Benzene	1.0	105%	95%	10%
Trichloroethene	1.0			
1,2-Dichloropropane	1.0			
Dibromomethane	1.0			
Bromodichloromethane	1.0			
cis-1,3-Dichloropropene	1.0			
Toluene	1.0	101%	93%	8%
trans-1,3-Dichloropropene	1.0			
1,1,2-Trichloroethane	1.0			
1,3-Dichloropropane	1.0			
Dibromochloromethane	1.0			
Tetrachloroethene	1.0			
1,2-Dibromoethane (EDB)(*)	0.01			
Chlorobenzene	1.0			
1,1,1,2-Tetrachloroethane	1.0			
Ethylbenzene	1.0			
Xylenes	1.0			
Styrene	1.0			
Bromoform	1.0			
1,1,2,2-Tetrachloroethane	1.0			
Isopropylbenzene	1.0			
1,2,3-Trichloropropane	1.0			
Bromobenzene	1.0			
n-Propylbenzene	1.0			
2-Chlorotoluene	1.0			
4-Chlorotoluene	1.0			
1,3,5-Trimethylbenzene	1.0			
tert-Butylbenzene	1.0			
1,2,4-Trimethylbenzene	1.0			
sec-Butylbenzene	1.0			
1,3-Dichlorobenzene	1.0			
1,4-Dichlorobenzene	1.0			
Isopropyltoluene	1.0			
1,2-Dichlorobenzene	1.0			
n-Butylbenzene	1.0			
1,2-Dibromo-3-Chloropropane	1.0			
1,2,4-Trichlorobenzene	1.0			
Naphthalene	1.0			
Hexachloro-1,3-butadiene	1.0			
1,2,3-Trichlorobenzene	1.0			

*-instrument detection limits

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WA DEPT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Analytical Results

8260, µg/L		MS	MSD	RPD
Matrix	Water	Water	Water	
Date extracted	Reporting	04/24/03	04/24/03	
Date analyzed	Limits	04/24/03	04/24/03	

Surrogate recoveries

Dibromofluoromethane	101%	101%
Toluene-d8	94%	95%
4-Bromofluorobenzene	96%	107%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

SVOC water

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WASHINGTON DEPARTMENT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Result
Duplicate Result

Analytical Results

8270, µg/L	MTH BLK		LCS	SP4-W	SP4-4D	MS	MSD	RPD
Matrix	Water	Water	Water	Water	Water	Water	Water	
Date extracted	Reporting	04/23/03	04/24/03	04/23/03	04/23/03	04/24/03	04/24/03	
Date analyzed	Limits	04/23/03	04/24/03	04/23/03	04/23/03	04/24/03	04/24/03	
Penachloroethane	2.0	nd		nd	nd			
Bis (2-chloroethyl) ether	2.0	nd		nd	nd			
1,3-Dichlorobenzene	2.0	nd		nd	nd			
1,4-Dichlorobenzene	2.0	nd		nd	nd			
1,2-Dichlorobenzene	2.0	nd		nd	nd			
2-Methylphenol (o-cresol)	2.0	nd		nd	nd			
Bis (2-chloroisopropyl) ether	2.0	nd		nd	nd			
3,4-Methylphenol (m,p-cresol)	2.0	nd		nd	nd			
Bis (2-chloroethoxy) methane	2.0	nd		nd	nd			
1,2,4-Trichlorobenzene	2.0	nd		nd	nd			
Naphthalene	1.0	nd		94	120			
Hexachloropropylene	10	nd		nd	nd			
Hexachlorobutadiene	10	nd		nd	nd			
1,2,4,5-Tetrachlorobenzene	2.0	nd		nd	nd			
Hexachlorocyclopentadiene	2.0	nd		nd	nd			
2,4,5-Trichlorophenol	10	nd		nd	nd			
2-Chloronaphthalene	2.0	nd		nd	nd			
Dimethylphthalate	2.0	nd		nd	nd			
Acenaphthylene	1.0	nd	93%	nd	nd	96%	114%	17%
Acenaphthene	1.0	nd		nd	nd			
Pentachlorobenzene	2.0	nd		nd	nd			
Fluorene	1.0	nd		nd	nd			
Diethylphthalate	10	nd		nd	nd			
4-Chlorophenylphenylether	2.0	nd		nd	nd			
N-Nitrosodiphenylamine	2.0	nd		nd	nd			
4-Bromophenylphenylether	2.0	nd		nd	nd			
Hexachlorobenzene	2.0	nd		nd	nd			
Phenanthrene	1.0	nd		nd	nd			
Anthracene	1.0	nd		nd	nd			
Di-n-butylphthalate	2.0	nd		nd	nd			
Fluoranthene	1.0	nd		nd	nd			
Pyrene	1.0	nd	89%	nd	nd	94%	107%	13%
Butylbenzylphthalate	10	nd		nd	nd			
Benzo(a)anthracene	2.0	nd		nd	nd			
Chrysene	0.1	nd	97%	nd	nd	85%	95%	11%
Bis (2-ethylhexyl) ether	2.0	nd		nd	nd			
Di-n-octylphthalate	10	nd		nd	nd			
Benzo(b)fluoranthene	1.0	nd		nd	nd			
Benzo(k)fluoranthene	1.0	nd		nd	nd			
Benzo(a)pyrene	0.1	nd		nd	nd			
Dibenzo(a,h)anthracene	1.0	nd		nd	nd			
Benzo(ghi)perylene	1.0	nd		nd	nd			
Indeno(1,2,3-cd)pyrene	1.0	nd		nd	nd			

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30423-2
Client: WASHINGTON DEPARTMENT OF ECOLOGY
Client Job Name: PUGNETTI PARK
Client Job Number: JIB29

Analytical Results

8270, µg/L		MTH BLK	LCS	SP4-W	SP4-4D	MS	MSD	RPD
Matrix	Water	Water	Water	Water	Water	Water	Water	
Date extracted	Reporting	04/23/03	04/24/03	04/23/03	04/23/03	04/24/03	04/24/03	
Date analyzed	Limits	04/23/03	04/24/03	04/23/03	04/23/03	04/24/03	04/24/03	

Surrogate recoveries

2-Fluorobiphenyl	100%	96%	100%	100%	95%	93%
4-Terphenyl-d14	93%	91%	91%	91%	87%	85%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

CLIENT: DEPARTMENT OF ECOLOGY Joyce DATE: 4.2.03 PAGE 1 OF 1
 ADDRESS: PO Box 47775 OLYMPIA PROJECT NAME: PUGNETTI PARK
 PHONE: 360 407-6260 FAX: 407-6305 LOCATION: PUGNETTI PARK
 CLIENT PROJECT #: J11529 PROJECT MANAGER: Mercuri COLLECTOR: ESNNW/ECOLOGY DATE OF COLLECTION: 4/16/03

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES	VOA 8021B BTEX ONLY	TPH - HClD	TPH 8015 (gasoline)	TPH 8015 (diesel)	PAH 8100	POB 8082	EPH	VPH	Metanaphthalene	Hex Chlorine	MUTPH EX	MUTPH DX	NOTES	Total Number of Containers	Laboratory Note Number	
1. SP6-S-12	12-14		Soil	4oz jar		X									X	X	X	X	Disregard HClD in table	2	
2. B1-S-16	16-18		Soil	4oz jar		X								X	X	X	X	X	"	2	
3. B2-I-12	12-14		Soil	4oz jar		X								X	X	X	X	X	"	2	
4. B3-R-20	20-24		Soil	4oz jar										X	X	X	X	X	"	2	
5.																			"	2	
6. SP4-W			Water	Various		X								X	X	X	X	X	"	6	
7. SP4-W-D			Water	Various		X								X	X	X	X	X	"	6	
8. SP3-W			Water	Various										X	X	X	X	X	"		
9. B1-W			Water	Various										X	X	X	X	X	"	4	
10.																					
11.																					
12.																					
→ Dispose of #6 & 7 from 4/11/03. Replace w/ 9 & 10 from 4/12/03 <i>James Macneil</i>																					
13.																					
14.																					
15.																					
16.																					
17.																					
18.																					

RELINQUISHED BY (Signature) David Thurner DATE/TIME 4.2.03 4:15pm RECEIVED BY (Signature) A. Newman DATE/TIME 4/16/03 6:15pm
 RELINQUISHED BY (Signature) David Thurner DATE/TIME 4.2.03 4:15pm RECEIVED BY (Signature) A. Newman DATE/TIME 4/16/03 6:15pm
 SAMPLE DISPOSAL INSTRUCTIONS: Dispose of #64 7 from 4/16/03. Replace w/ 9+10 from 4/2/03 Joyce
 LABORATORY NOTES: Sday From 4/4
 TOTAL NUMBER OF CONTAINERS: 1
 CHAIN OF CUSTODY SEALS Y/N/A: Y
 SEALS INTACT? Y/N/A: Y
 RECEIVED GOOD COND./COLD: Y
 NOTES: Turn Around Time: 24 HR 48 HR 5 DAY

CHAIN-OF-CUSTODY RECORD

CLIENT: Department of Ecology & Environmental Services						DATE: 4-2-03		PAGE: 1	OF: 1
ADDRESS: PO Box 407775, Olympia WA 98504						PROJECT NAME: Pugnotti Park			
PHONE: 360 407 6260						FAX: 360 407 6305			
CLIENT PROJECT #: 1B29						PROJECT MANAGER: Mercuri			
LOCATION: Pugnotti Park						COLLECTOR: Ecology / ESMPD		DATE OF COLLECTION: 4-2-03	

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES	VOL 802/BTEX ONLY	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	PAH 8100	PCBS 8082	EPH	VPH	Methamphetamine	Hex Chrome	NOTES	Total Number of Containers	Laboratory Note
1. SP6-W		830	Ruby	Various												X 6 was used	8	
2. BQ-16		1135	Soil	4oz jar												X 1 liter Pb	2	
3. BQ-17		1248	Soil	4oz jar													2	
4. BQ-18		2117	Soil	4oz jar													2	
5. BQ-19		346	Soil	4oz jar													2	
6. BQ-20-D		346	Soil	4oz jar													2	
7. BQ-20-D		500	Soil	4oz jar													2	
8. BQ-26		600	Water	Various		XX											2	
9. SP4-W		600	Water	Various		XX											2	
10. SP4-W-D																	2	
11.																	2	
12.																	2	
13.																	2	
14.																	2	
15.																	2	
16.																	2	
17.																	2	
18.																	2	

CONFIRMED DISPOSAL BY SPW + SPWD FOR 4/1/03 & replace all same this from 4/2/03

Also - According pb - will run total and dissolved on SP4-W - at end of day

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
<i>[Signature]</i>	4-2-03 6:15pm	<i>[Signature]</i>	4-2-03 6:15pm

SAMPLE DISPOSAL INSTRUCTIONS

ESN DISPOSAL @ \$2.00 each ☐ Return ☐ Pickup

Turn Around Time: 24 HR 8 HR 5 DAY



Environmental
Services Network

MWS7A at Albers Mill

June 6, 2003

Joyce Mercuri
Department of Ecology – SW Region
P.O. Box 47775
Olympia, WA 98504-7775

Dear Ms. Mercuri:

Please find enclosed the analytical data report for the Pugnetti Park Project in Tacoma, Washington. Direct Push services were conducted on June ~~4~~ 5, 2003. Water samples were analyzed for Hydrocarbon Identification by NWTPH-HCID, Diesel by NWTPH-Dx, and Gasoline by NWTPH-Gx on June 5, 2003.

The results of these analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed.

ESN Northwest appreciates the opportunity to have provided geosampling and analytical services to the Department of Ecology for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Michael A. Korosec
President

ESN NORTHWEST CHEMISTRY LABORATORY

PUGNETTI PARK PROJECT
Washington
Department of Ecology

Hydrocarbon Identification by NWTPH-HCID for Waters

Date Analyzed	Reporting Limits	Method	MW57A (ug/l)	SP-1 (ug/l)	SP-1 Dup. (ug/l)	SP-2 (ug/l)
Gasoline	250	Blank 6/5/03	6/5/03	6/5/03	6/5/03	6/5/03
Stoddard solvent / Mineral spirits	250	nd	nd	nd	nd	nd
Kensol	250	nd	nd	nd	nd	nd
Kerosene / Jet fuel	250	nd	nd	nd	nd	nd
Diesel / Fuel oil	500	nd	nd	nd	nd	nd
Bunker C	500	nd	nd	nd	nd	nd
Heavy oil	500	nd	nd	nd	nd	nd
Unidentifiable petroleum products	250	nd	nd	nd	nd	nd
Surrogate recovery:	100		104	86	96	94

"nd" Indicates not detected at listed detection limits.

"D" Indicates detected above the listed detection limit.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 65% TO 135%

ANALYSES PERFORMED BY:

Marilyn Farmer

ESN NORTHWEST CHEMISTRY LABORATORY

PUGNETTI PARK PROJECT

Washington

Department of Ecology

Analyses of Diesel (NWTPH-Dx) in Water

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (ug/l)
Method Blank	6/5/03	100	nd
MW57A	6/5/03	104	nd
SP-1	6/5/03	86	nd
SP-1 Dup.	6/5/03	96	nd
SP-2	6/5/03	94	nd
Method Detection Limits			200

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 65% TO 135%

ANALYSES PERFORMED BY: Marilyn Farmer

ESN NORTHWEST CHEMISTRY LABORATORY

PUGNETTI PARK PROJECT

Washington

Department of Ecology

Analyses of Gasoline (NWTPH-Gx) in Water

Sample Number	Date Analyzed	Surrogate Recovery (%)	Gasoline (ug/l)
Method Blank	6/5/03	102	nd
MW57A	6/5/03	104	nd
SP-1	6/5/03	109	nd
SP-1 Dup.	6/5/03	97	nd
SP-2	6/5/03	95	nd
Method Detection Limits			100

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65% TO 135%

ANALYSES PERFORMED BY:

Marilyn Farmer

RESOURCE PROTECTION WELL REPORT Notice of Intent No R 64077

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission (*x* in circle)

☒ Construction

☐ Decommission *Original Construction Notice*

of Intent Number _____

140501

Property Owner City of Tacoma

Unique Ecology Well ID Tag No AHP-275

Consulting Firm Department of Ecology

Driller or Trainee Name Anisa Newman

Driller or Trainee Signature Anisa Newman

Driller or Trainee License No 2508

If trainee licensed driller's

Signature and License no _____

Type of Well (*x* in circle)

☒ Resource Protection

☐ Geotech Soil Boring

Site Address Pugnetti Park

City Tacoma County Pierce

Location NE 1/4 - 1/4 NW 1/4 S c 9 Twn 20N R. 3 ☒ circle or one well

Lat/Long (s t r Lat Deg Lat Min/Sec

still REQUIRED) Long Deg Long Min/Sec

Tax Parcel No _____

Cased or Uncased Diameter 2" Static Level 155'

Work/Decommission Start Date 4 / 03

Work/Decommission Completed Date 4 / 03

Construction/Design

Well Data

Formation Description

	MONUMENT TYPE	<u>flush mount</u>
	CONCRETE SURFACE SEAL	<u>0-1 1/2'</u>
	BACKFILL TYPE	<u>1 1/2'-7' bentonite chips</u>
	PVC BLANK	<u>0 5'-8'</u>
	PVC SCREEN	<u>8'-18'</u>
	SLOT SIZE	<u>0/10</u>
	TYPE	<u>3/4" PVC schedule 40</u>
SAND PACK MATERIAL	<u>7'-18' 10/20 colorado silica sand</u>	
WELL DEPTH	<u>18'</u>	

RECEIVED

SEP 08 2003

DEPARTMENT OF ECOLOGY
WELL DRILLING UNIT

Scale 1 = _____

Page 1 of 1

ECY 050 12 (Rev 2/01)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report

The Department of Ecology does NOT Warrant the Data and/or the Information on this Well Report. I Report.

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in circle)

☒ Construction

☒ Decommission ORIGINAL INSTALLATION Notice

174937 of Intent Number E000369

Consulting Firm Department of Ecology

Unique Ecology Well ID

Tag No: B2

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

☐ Driller ☐ Engineer ☐ Trainee Name (Print) Anisa Newman

Driller/Engineer/Trainee Signature Anisa Newman

Driller or Trainee License No. 2508

Driller, licensed driller's signature and License no. _____

CURRENT

Notice of Intent No. A 67789

Type of Well ("x" in circle)

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner City of Tacoma

Site Address Pagnetti Park

City Tacoma County: Pierce

Location NE^{1/4} NW^{1/4} Sec 9 Twp 20N R 3 ☒ circle or WWM

Lat/Long (s, t, r) Lat Deg _____ Lat Min/Sec _____

still REQUIRED) Long Deg _____ Long Min/Sec _____

Tax Parcel No. _____

Cased or Uncased Diameter 2" Static Level _____

Work/Decommission Start Date 4-1-03

Work/Decommission Completed Date 4-1-03

Construction/Design

Well Data

Formation Description

-drew a retractable stainless steel screen down to 21' bgs and collected a water sample

- removed all rods from boring and backfilled with bentonite

sandy gravel fill
0-20

glacial till
20-24

RECEIVED

JUN 22 2005

DEPARTMENT OF ECOLOGY

CHAIN-OF-CUSTODY RECORD

CLIENT: Department of Ecology
 ADDRESS: Byco Mercari
 PHONE: 407-6260 FAX: 407-7154
 CLIENT PROJECT #: 6/14/03 PROJECT MANAGER: ANISA

DATE: 6/14/03 PAGE 1 OF 1
 PROJECT NAME: Pugnetti Park
 LOCATION: MWSTA, SP1, SP2
 COLLECTOR: ANISA DATE OF COLLECTION: 6/14/03

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES	VOA8021B	VOA8021B BTEX ONLY	TPH-HC10	TPH 8015 (gasoline)	TPH 8015 (diesel)	PAH 8100	PCBs 8082	EPH	VPH	Methamphetamine	Hex Chrome	NOTES	Total Number of Containers	Laboratory Note Number
1. MWSTA		11:15	Water	3 VOA														4	
2.				plus 1 liter															
3.				amber															
4. SP-1		12:33	Water															4	
5.																			
6. SP-2		13:00	Water															4	
7.																			
8.																			
9.																			
10.																			
11.																			
12.																			
13.																			
14.																			
15.																			
16.																			
17.																			
18.																			

REINQUISHED BY (Signature) Byco Mercari DATE/TIME 6/14/03 2:03 RECEIVED BY (Signature) C. Newman DATE/TIME 6/14/03

REINQUISHED BY (Signature) Byco Mercari DATE/TIME 6/14/03 2:03 RECEIVED BY (Signature) C. Newman DATE/TIME 6/14/03

SAMPLE DISPOSAL INSTRUCTIONS

☒ ESN DISPOSAL @ \$2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS 4

CHAIN OF CUSTODY SEALS Y/N/A Y

SEALS INTACT? Y/N/A Y

RECEIVED GOOD COND./COLD Y

NOTES: at Manchester Lab 300-871-8804 Need to identify specific compounds per TC w/ Mike K

LABORATORY NOTES: Turn Around Time: 24 HR 48 HR 5 DAY

APPENDIX H

ESN NORTHWEST, INC.

INVOICE

ESN Northwest Inc. Tax ID #91-1510006
Phone: (360) 459-4670; Fax: (360) 459-3432

INVOICE #
030401-6

INVOICE DATE
April 24, 2003

CLIENT JOB #
J1B29

BILL TO: Department of Ecology - SW Region
P.O. Box 47775
Olympia, WA 98504

ATTN: Joyce Mercuri, Project Manager

PROJECT: Pugnetti Park
Tacoma, Washington

DATE	QUANTITY	DESCRIPTION	UNIT COST	TOTAL
April 1 & 2	2 Days	Direct Push Services	\$1,500.00	\$3,000.00
	1 Hour	Overtime	\$200.00	\$200.00
	248 Feet	Liner	\$1.00	\$248.00
	10 Feet	Screen	\$5.00	\$50.00
	10 Feet	Riser	\$3.00	\$30.00
	1	Well Start Card	\$50.00	\$50.00
	1	Water Sampling Start Card	\$50.00	\$50.00
	1	Cap/Plug Set	\$30.00	\$30.00
	1	Monument	\$85.00	\$85.00
	15	NWTPH-Dx/Dx Ext. - soil & water	\$50.00	\$750.00
April 4 - 24	15	NWTPH-Gx and BTEX - soil & water	\$50.00	\$750.00
	4	8260 - soil & water	\$125.00	\$500.00
	4	8270 - soil & water	\$260.00	\$1,040.00
	5	Total Pb - soil & water	\$30.00	\$150.00
	3	Dissolved Pb - water	\$30.00	\$90.00
Total Amount Due				\$7,023.00

TERMS: NET 30 DAYS

PLEASE SEND REMITTANCE TO THE ADDRESS BELOW

ESN Northwest Inc.
800 Sleater-Kinney SE, PMB #262
Lacey, WA 98503-1127

SEPAS

ESN NORTHWEST, INC.

INVOICE

ESN Northwest Inc. Tax ID #91-1510006
Phone: (360) 459-4670; Fax: (360) 459-3432

INVOICE #
030401-7

INVOICE DATE
April 24, 2003

CLIENT JOB #
J1B29

BILL TO: Department of Ecology - SW Region
P.O. Box 47775
Olympia, WA 98504

ATTN: Joyce Mercuri, Project Manager

PROJECT: Pugnetti Park
Tacoma, Washington

DATE	QUANTITY	DESCRIPTION	UNIT COST	TOTAL
4/2	1.5 Hours	Overtime	\$200.00	\$300.00
Total Amount Due				\$300.00

TERMS: NET 30 DAYS

PLEASE SEND REMITTANCE TO THE ADDRESS BELOW

ESN Northwest Inc.
800 Sleater-Kinney SE, PMB #262
Lacey, WA 98503-1127

ESN NORTHWEST, INC.

filed

INVOICE

JUN 10 2003

Wash. State
Department of Ecology

ESN Northwest Inc. Tax ID #91-1510006
Phone: (360) 459-4670; Fax: (360) 459-3432

INVOICE #
030604-2

INVOICE DATE
June 6, 2003

CLIENT JOB #
J1B29

BILL TO: Department of Ecology - SW Region
P.O. Box 47775
Olympia, WA 98504

ATTN: Joyce Mercuri, Project Manager

PROJECT: Pugnetti Park
Tacoma, Washington

DATE	QUANTITY	DESCRIPTION	UNIT COST	TOTAL
6/4	1 Day	Direct Push Services - partial day	\$925.00	\$925.00
	1	Bond	\$150.00	\$150.00
	1	Permit	\$30.00	\$30.00
6/5	3	NWTPH-HCID - water	\$50.00	\$150.00
	3	NWTPH-Dx - water	\$60.00	\$180.00
	3	NWTPH-Gx - water	\$60.00	\$180.00
Total Amount Due				\$1,615.00

TERMS: NET 30 DAYS

PLEASE SEND REMITTANCE TO THE ADDRESS BELOW

ESN Northwest Inc.
800 Sleater-Kinney SE, PMB #262
Lacey, WA 98503-1127

Traffic Control Services
Serving Washington

EXHIBIT - A
PREVAILING WAGE - UTILITY
Jobs bid after 8-31-02

A. REGULAR HOURS:

\$36.75

The first eight hours Monday through Friday

B. OVERTIME HOURS:

\$53.50

Any hour worked over 8 regular Monday through Friday

Any hour worked Saturday

C. DOUBLE TIME HOURS:

\$ 70.00

Any hours worked after 8 overtime.

All hours worked Sunday and Holidays (listed below).

- There is a 4 hour minimum per call out.
- Two days notice is required when our company provides the equipment for set-up of traffic zones.
- There is a \$50.00 minimum for equipment.
- Equipment is charged in addition to flagger hourly rate.
- In order to meet DOT requirements we will require a Traffic Control Plan (TCP) prior to set-up.

Traffic Control Services will require 2 hours advance notice of a job cancellation.

HOLIDAY SCHEDULE:

January 1, New Year's Day

May 27, Memorial Day

July 4, Independence Day

September 2, Labor day

November 28 & 29, Thanksgiving Holiday

December 25, Christmas Holiday

These rates apply to work covered by Davis Bacon Act requirements in the following counties:

Island, San Juan, Skagit, Snohomish, Whatcom, Chelan, Clallam, Douglas, Grays Harbor, Jefferson, King, Kitsap, Kittitas, Lewis, Mason, Pacific, Pierce, Thurston, and Yakima

4 hour minimum + 50 eqript + 2 hr mobilization
~~4 hour minimum + 50 eqript + 2 hr mobilization~~

Letter of Transmittal



To: Joyce Mercuri
Wash. State Dept. of Ecology
PO Box 47600
Olympia, WA 98504

Date: July 21, 2003
Project No.: 203222.50
Project Name: Pugnetti Park
Regarding: Topographic Survey

Phone No.: 360-407-6260
Fax No.: 360-407-6305

WE ARE SENDING:

NO. COPIES	DATE	DESCRIPTION
1	7/21/03	18" X 24" Topographic Survey Map of Pugnetti Park, Tacoma, WA.

THESE ARE SENT VIA:

- ☐ Mail
☐ FedEx
☒ Hand delivered

- ☐ Client pick-up
☐ Other: _____

THESE ARE TRANSMITTED:

- ☐ For your review and comment
☐ For your use
☐ For approval

- ☐ Reviewed as noted
☒ As requested

REMARKS:

John W. Becker IV
Project Surveyor
AHBL, Inc.

c:\documents and settings\jbecker\my documents\pugnetti park 203222.doc

TACOMA
2215 North 30th Street
Suite 300
Tacoma, WA 98403-3350
253.383.2422 TEL
253.383.2572 FAX

www.ahbl.com

Invoice

AHBL, Inc.
Dietz/Hartlage, a division of AHBL, Inc.
2215 North 30th, Suite 300
Tacoma, WA 98403 Phone 253-383-2422

July 31, 2003
Project No: 203222.50
Invoice No: 0040987

WASHINGTON STATE DEPT. OF ECOLOGY
TOXICS CLEANUP PROGRAM
PO BOX 47600
OLYMPIA, WA 98504-7600

PUGNETTI PARK TOPO SURVEY

Professional services from June 26, 2003 to July 25, 2003

Professional Personnel

	Hours	Rate	Amount
Chief of Parties	1.00	110.00	110.00
Totals	1.00		110.00
Total Labor			110.00

Total this invoice \$110.00

Interest will be charged at 1-1/2% per month on all balances 30 Days Past Due.
(Please indicate project number on your check when paying.)

Invoice

AHBL, Inc.
Dietz/Hartlage, a division of AHBL, Inc.
2215 North 30th, Suite 300
Tacoma, WA 98403 Phone 253-383-2422

June 30, 2003
Project No: 203222.50
Invoice No: 0040732

WASHINGTON STATE DEPT. OF ECOLOGY
TOXICS CLEANUP PROGRAM
PO BOX 47600
OLYMPIA, WA 98504-7600

PUGNETTI PARK TOPO SURVEY

Professional services from May 26, 2003 to June 25, 2003

Professional Personnel

	Hours	Rate	Amount
Chief of Parties	5.00	110.00	550.00
Survey Crew	7.00	130.00	910.00
Totals	12.00		1,460.00
Total Labor			1,460.00

Total this invoice \$1,460.00

Outstanding Invoices

Number	Date	Balance
0040468	5/31/03	1,570.00
Total		1,570.00

Interest will be charged at 1-1/2% per month on all balances 30 Days Past Due.
(Please indicate project number on your check when paying.)

Invoice

AHBL, Inc.
Dietz/Hartlage, a division of AHBL, Inc.
2215 North 30th, Suite 300
Tacoma, WA 98403 Phone 253-383-2422

May 31, 2003
Project No: 203222.50
Invoice No: 0040468

WASHINGTON STATE DEPT. OF ECOLOGY
TOXICS CLEANUP PROGRAM
PO BOX 47600
OLYMPIA, WA 98504-7600

PUGNETTI PARK TOPO SURVEY

Professional services from April 26, 2003 to May 25, 2003

Professional Personnel

	Hours	Rate	Amount
Chief of Parties	6.00	110.00	660.00
Survey Crew	7.00	130.00	910.00
Totals	13.00		1,570.00
Total Labor			1,570.00

Total this invoice \$1,570.00

Interest will be charged at 1-1/2% per month on all balances 30 Days Past Due.
(Please indicate project number on your check when paying.)

APPENDIX I

File Review/History of Pugnetti Park

1983, entire area redesigned and storm drains installed in conjunction with construction of I-705.

9/93, Bison Environmental. UST removal, Site Assessment Report, Historical Society/Union Station site. Removed 10,000 gallon gas, 10,000 gallon diesel; 4,000 gallon used oil tank, and fuel island in 1992. This is just to the north of Pugnetti Park, in what is now the History Museum parking lot. This is not the former Bridgestone/Silverton Gas station on the Pugnetti Park site proper.

7/99, City of Tacoma tested infiltration into manhole ## 6467450 (former ID #447), located in the 21st Street right of way at the south edge of Pugnetti Park. Water was observed flowing through a tear into an asphalt-lined corrugated metal pipe that was installed by the Department of Transportation when the sewers were re-aligned for the I-705/SR509 project. This infiltrate contained 240 ppb benzene, 0.7 ppm WTPH-Gasoline, 34 ppb ethylbenzene; 19 ppb toluene; 60 ppb total xylenes.

7/99, City of Tacoma tested infiltration into a catch basin to the north of Pugnetti park, directly behind (east of) the Washington State History Museum. This contained 29 ppb benzene, 0.6 ppm WTPH-Gasoline, and 12 ppb total xylenes.

2/00, City of Tacoma videotaped the line that crosses Pugnetti Park in a north-south direction, and found it to be tight with no leaks. (except for the previously identified tear in the manhole at #6467450).

3/1/00, WSDOT conducted magnetometer site survey to determine if tanks still existed. No report was provided to Ecology and it was never confirmed this study was really done.

6/00: Infiltration into the catch basin behind the History Museum was stopped by grouting (see June 23, 2000 Letter from Larry McDonald, Museum Facilities Services, to Troy Naccarato, City of Tacoma, in Pugnetti Park file).

8/1/00: Initial investigation report. Tacoma-Pierce County Health Department installed 4 wells, SP-1 through SP-4. Gasoline, diesel, and BTEX contamination confirmed in soil and groundwater. (Site placed on CSCS list 12/00).

10/00: Installed micro-well for hydrogeologic symposium demonstration, SP-5.

12/00: Micro well sampled by City of Tacoma. Free product present (gasoline), 4,200 ppb. Fingerprint from Tacoma lab – “old gasoline”.

5/9/01: City of Tacoma re-tested the water flowing into the tear in the pipe at MH 447, and found 3,140 ppb gasoline.

6/14/01: Ecology contracted with Geopotential for a magnetometer and GPR survey of the site (\$1101). No present tanks identified, but disturbed areas where they might have been were identified.

8/01: Site was ranked as "2".

12/01: City staff entered manhole. Confirmed damaged area 4.5 feet downstream of manhole, where there was a tear in the corrugated metal pipe (no infiltration, as it appeared to be patched from the outside). The hole where infiltration occurs is closer to the manhole. Sampled infiltrate and found BTEX and Gasoline (230 ppb benzene, 920 ppb gasoline).

12/01: TPCHD tested SP-5. Split with Tacoma to run gas/diesel also at Tacoma lab. Diesel, 4,010 ppb; motor oil 2,600 ppb; gasoline 17,000 ppb.

3/02: Tested dry-weather flow in MH 446 (just to north of Pugnetti Park, and just upstream from the one with the leak in it.) Benzene present at 1 ug/l. Also some low-level hits of chlorinated solvents (probably coming from infiltration into storm drain pipes from upstream TCE plumes on University of Washington Campus area).

Late 2002?: Widening of Pacific Avenue resulted in the sidewalk on the west (Pacific Avenue) site of Pugnetti Park being modified to remove several feet of the sidewalk. This resulted in SP1 and SP2, which had formerly been located in the sidewalk, now being located at the edge of the northbound Pacific Avenue traffic lane.

12/02 – 2/03: planning, access agreements, permits for investigation (Access gained from History Museum and DOT.) Attempted to gain access from City for installation of well in sidewalk across Pacific Avenue from the site – City not willing at first. Decided to proceed with Pugnetti Investigation w/out access for upgradient well in place).

3/03: Revised Draft scope of work for soil and groundwater sampling using Clean Sites Initiative funds. (this later became the final scope).

4/1 – 4/2/03: Installed one well, conducted nine borings. Obtained water samples from SP-3, 4, and new well (SP-6). Obtained water sample from Boring 1. Obtained soil samples from all borings.

6/2/03: With City of Tacoma Source control Staff, conducted drain survey and sampling project to test infiltration in upstream and downstream storm drains.

6/4/03: Sampled SP-1 and SP-2, and MW S7A at Albers Mill. Attempted to install boring in Pacific Avenue, but were unable to because of underground utilities.