SECOR
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REMEDIAL INVESTIGATION AND ASSESSMENT OF GROUNDWATER REMEDIAL ALTERNATIVES CASCADE NATURAL GAS CORPORATION SUNNYSIDE, WASHINGTON

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Submitted by
SECOR

For
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1.0 INTRODUCTION

This report documents the results of a Remedial Investigation/Feasibility Study (RI/FS) conducted at the Cascade Natural Gas Corporation (CNG) Facility located at 512 East Decatur Avenue in Sunnyside, Washington (Figure 1). Petroleum hydrocarbons were identified in soil and groundwater at the CNG Facility during closure of underground storage tanks (USTs) at the facility in 1990.

The Washington State Department of Ecology (Ecology) has notified two owners and operators (previous and current) of their status as potentially liable persons (PLPs) as defined under the Revised Code of Washington (RCW) 70.105D.040, and the Model Toxics Control Act Cleanup Regulation [MTCA, Chapter 173-340 of the Washington Administrative Code (WAC)]. The named PLPs include:

- Cascade Natural Gas Corporation; and

- Yakima County.

Cascade Natural Gas Corporation, in order to address potential environmental and public health concerns, removed and remediated petroleum-contaminated soil at the Facility and initiated an investigation to assess for the presence of petroleum hydrocarbons and other suspected compounds in the soil, groundwater, and sewer system at the CNG Facility.

Subsequent to the UST removals and the initial facility investigation, CNG requested that the remaining facility investigation (the RI/FS), and any appropriate remedial action that may be warranted, be conducted in cooperation with Ecology under an Agreed Order pursuant to WAC 173-340-530.

Ecology and CNG successfully negotiated Agreed Order No. DE94TC-C165, with an effective date of April 15, 1994. The Agreed Order calls for implementation of the RI/FS actions, as set forth and described in the following documents, which are incorporated in the Agreed Order:

- SEACOR[1], July 23, 1992. *Revised Work Plan for Remedial Investigation and Assessment of Groundwater Remediation Alternatives for Cascade Natural Gas Corporation.*

- SEACOR, October 16, 1992. *Addendum No. 1 to the Revised Work Plan for Remedial Investigation and Assessment of Groundwater Remediation Alternatives for Cascade Natural Gas Corporation.*

- SEACOR, March 15, 1993. *Modifications to Revised Work Plan for Remedial Investigation and Assessment of Groundwater Remediation Alternatives for Cascade Natural Gas Corporation.*

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[1] SECOR International Incorporated operated as Science & Engineering Analysis Corporation under the SEACOR trademark through September 1994. The legal corporate name was changed to SECOR International Incorporated with the trade name of SECOR in October 1994.

- SEACOR, January 21, 1994. *Exhibit A - Addendum Remedial Investigation and Assessment of Groundwater Remedial Alternatives.*

A copy of Agreed Order No. DE94TC-C165 is provided in Appendix A to this document.

1.1 PURPOSE AND SCOPE

The purpose of the RI/FS was to collect, develop, and evaluate information regarding impacts at the CNG Facility; and to facilitate the selection of an appropriate remedial action or actions. RI/FS field activities included the following:

- Drilling and installing eight shallow groundwater monitoring wells;
- Collecting 11 soil samples, 5 sewer/drain samples, and 21 groundwater samples for laboratory analyses; and
- Monitoring and sampling four previously installed monitoring wells.

The RI/FS scope of work is outlined in greater detail in Section 4.1, and in the four SECOR documents (July 23, 1992; October 16, 1992; March 15, 1993; and January 21, 1994) cited in the previous section.

The agreed scope of work contained two major contingencies, only one of which was to be implemented. The selection of the implemented contingency was based on the analytical results of preliminary groundwater samples obtained in July of 1993 from selected wells downgradient of the CNG facility. These contingencies and trigger levels are specified and discussed in detail in the October 16, 1992 and March 15, 1993 addendum and modifications to the Work Plan.

One of the contingencies (Scenario 1) was to be implemented if the water quality of samples from the selected wells did not exceed trigger levels. Under Scenario 1 an aquifer test and a feasibility study would not be conducted. Instead, a groundwater monitoring program would be implemented. Under the other contingency (Scenario 2) the aquifer test and feasibility study would be completed and an appropriate remedial action plan would be developed.

1.2 FACILITY BACKGROUND

In 1990, to comply with Washington State UST regulations, CNG retained a contractor to remove and close a single gasoline UST, the only UST which CNG was aware of at the site. During removal of the gasoline UST, CNG discovered three other USTs, and determined that soil and groundwater beneath the site contained total petroleum hydrocarbons (TPH) in the gasoline and diesel ranges, and various volatile and semi-volatile organic compounds. The concentrations of some of the identified TPH and organic compounds exceeded the draft MTCA Method A cleanup levels (WAC 173-340-720 and 740) at that time.

The discovery of the TPH and organic compounds at the facility prompted CNG to initiate an immediate interim action cleanup during which time approximately 2,100 cubic yards of impacted soil were excavated, removed, remediated, and disposed of at an approved off-site location (Terrace Heights Landfill near Yakima, Washington).

The Department of Ecology also conducted a Site Hazard Assessment in 1991 to assess soil and groundwater conditions beneath the CNG Facility. The Site Hazard Assessment identified TPH constituents and volatile and semi-volatile organic compounds in soil and/or groundwater beneath the CNG Facility.

1.3 SETTING

The City of Sunnyside is located in eastern Yakima County, within the south central portion of the State of Washington. This portion of Yakima County can be generally described as containing broad valleys, filled with stream deposited sediments, surrounded by smooth unforested ridges. The climate is semi-arid, with total annual rainfall of approximately 7.2 inches per year (DRPA and SAIC, May 1991). Air temperatures vary greatly through the year; commonly dropping below 30 degrees Fahrenheit in winter and rising above 90 degrees Fahrenheit in summer.

Surface water in the site vicinity drains to the south towards the Yakima River, located approximately 5 miles south of the City of Sunnyside. Within the CNG Facility vicinity, shallow soils have been described as primarily silts and fine-grained sand, with minor coarse-grained sands or larger material sizes (i.e., gravels). Saturated groundwater conditions are present at relatively shallow depths, commonly occurring at depths of approximately 8 to 11 feet below ground surface. Groundwater generally flows to the south/southwest under a gradient of approximately 0.008 to 0.01 feet per foot (Section 4.2.2 of this report).

1.4 REPORT ORGANIZATION

The remainder of this report has been organized into the following five sections:

- **2.0 - General Facility Information and Background Conditions:** Section 2.0 provides background facility information, and additional overview of site conditions.

- **3.0 - Previous Environmental Investigations:** Section 3.0 provides a review of previous environmental investigations, and a summary of observed petroleum hydrocarbon impacts documented prior to the initiation of RI/FS field activities.

- **4.0 - Field Investigation:** Section 4.0 presents the scope of work as implemented, and the results of the RI/FS field activities.

- **5.0 - Conclusions and Recommendations:**

- **6.0 - References:**

2.0 GENERAL FACILITY INFORMATION AND BACKGROUND CONDITIONS

This section presents general Facility information, and a summary of Facility conditions, excluding the results of the RI/FS investigation (see Section 4.0).

2.1 PROJECT TITLE

The RI/FS project title is the Remedial Investigation and Assessment of Groundwater Remediation Alternatives for Cascade Natural Gas Corporation. The RI/FS was conducted pursuant to Agreed Order No. DE 94TC-C165 between Ecology and CNG.

2.2 PROJECT COORDINATORS

As specified in the Agreed Order, the Project Coordinator for Ecology is:

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2.3 OPERATIONAL HISTORY

The site has been owned by Cascade Natural Gas Corporation since 1979. Yakima County used the property as a public works equipment and maintenance facility for many years prior to 1969. Thereafter, three automobile dealerships/garages owned and operated the site until CNG first leased the property in 1969[2]. Title records confirm the following ownership history:

- Yakima County from November 7, 1936 to June 10, 1955;

[2] The operational and ownership history of the site was documented in a June 17, 1991 report by Kleinfelder, Inc., consultants to Yakima County. The information presented in this section has been extracted from the 1991 Kleinfelder, Inc., report and supplemented with information gathered since that time.

- Mr. Grant McLean, dba McLean Motors & Tool Company, from June 10, 1955 to January 1, 1956;

- Mr. Walter Hiligoss, dba Sunnyside Dodge, from January 1, 1956 to October 10, 1960; and

- Mr. Frank Hiscock, dba Sunnyside Dodge, from October 10, 1960 to November 29, 1979

A Sanborn Fire Insurance Map for 1910 documents a storage building on the southeastern portion of the property. By 1928, Yakima County occupied the site and expanded the storage capacity and work space of the building. The Sanborn Fire Insurance Map for 1928 indicates several changes to the property, including a warehouse building and blacksmith shop located adjacent to the County machine storage area. An oil storage area is also identified on the Sanborn map. By 1936, the County installed two underground storage tanks, one to store gasoline and the other to store diesel fuel. Two dispensers, one for each fuel product, were used for vehicle and equipment fueling. The County also serviced its trucks in the shop on the property. The 1944 Sanborn Fire Insurance Map does not reflect any changes from the 1928 map. An oil storage building was also located on-site until 1946 and used oil and kerosene were stored in 55-gallon barrels on the property. The site was unpaved throughout the County's ownership.

In the early 1950s, the storage building on-site was partially destroyed by fire. In the mid-1950s, a third UST was installed and shortly before or after that time, the Sunnyside Dodge operation replaced Yakima County as site owners and occupants. When the County left the site, the USTs were abandoned and were not removed. At approximately the time that the Dodge dealership began operation, the on-site structure was remodeled and a new UST was used to store diesel fuel to heat the building.

In 1960, a fourth UST was installed and used to store gasoline. The dispenser pump for this new gasoline UST was located directly above the new UST and was used to fuel vehicles. Diesel fuel, which at the time was stored in one of the three previous USTs, was pumped directly to the heater located in the structure. Sometime during the mid-1960s, use of the diesel UST ceased; however, none of the USTs were removed.

In the late 1960s, the heating system for the building was converted to natural gas and electric baseboard heat. By the late 1960s, the ground surface of the site was paved and all four USTs were still present at the site (two diesel and two gasoline). However, only one of the USTs was being used; the other three having been abandoned but never removed.

The site was operated as an automobile sales and service business until 1969, when CNG first leased the property. From the time it began to occupy the property in 1969 until 1980, CNG used only the new gasoline UST which had been installed in 1960. That was the only UST CNG was aware of on-site. In September 1990, CNG hired a contractor to remove that UST. Upon excavation, the other three USTs were discovered. All four USTs were subsequently decommissioned by excavation and removed. Upon excavation, the one UST used for gasoline storage by CNG was observed to have the potential for a small leak at its fill cap, but was otherwise intact. The three other USTs were observed to have substantially degraded and at least two had visible holes.

2.4 SUBSURFACE UTILITIES

There are two exterior storm water catch basins and two interior flow drains on the CNG site. Catch basins and floor drains discharge via a common subsurface line to a city storm drain located beneath the north side of East Decatur Avenue (Figure 2). A county drain, which was installed to improve soil drainage and alleviate problems associated with seasonal high groundwater conditions, is located south of the city storm drain beneath East Decatur Avenue (Figure 2).

The county drain is constructed of clay/vitreous pipe with an inside diameter of approximately 8 inches. The drain is located approximately 13 feet below ground surface in the 500 block of East Decatur Avenue. The city storm drain is also constructed of clay/vitreous pipe, with an inside diameter of approximately 24 inches, and which is approximately 7 feet below ground surface in the 500 block of East Decatur Avenue. The city storm drain and the county drain flow from east to west in the vicinity of the CNG facility and discharge to an open ditch near the intersection of Lincoln Avenue and South Fourth Street, approximately 3,000 feet south of the CNG site and approximately 500 feet north of the Sunnyside Municipal Sewage Treatment Plant.

Sanitary sewers are located beneath the west side of South Fifth Street and in the alley between South Fifth and South Sixth Streets (Figure 2). The sanitary sewers flow south to the sewage treatment plant, and are approximately 7 feet below ground surface in the vicinity of the CNG site. Water mains are located beneath the east side of South Fifth Street and the south side of East Decatur Avenue. A natural gas line is located west of the site under South Fifth Street. The sanitary sewer lines, water mains, and natural gas lines are installed above first encountered groundwater and do not present a significant migration pathway for groundwater.

The sanitary sewer line that is located under South Fifth Street begins approximately 300 feet north of the intersection of South Fifth Street and East Decatur Avenue, near the location of Manhole-1 as shown on Figure 2. The sanitary sewer under South Fifth Street serves the trailer park west of the CNG site. The CNG site is connected to the sanitary sewer beneath the alley between South Fifth and South Sixth Streets.

2.5 GEOGRAPHY

The elevation of the facility is approximately 740 feet above sea level, or about 100 feet higher than the Yakima River (USGS, 1978). Surface water within Sunnyside is directed through the storm sewer system following the gently south-sloping topography. The topography of the area is shown on Figure 1.

The ground surface at the CNG site is completely covered with either buildings, asphalt, or concrete. In covered areas, surface water generated during precipitation events is directed into the storm sewer system.

Land use in the vicinity of the CNG site is shown on Figure 3. A residential trailer park with 53 platted lots is located west of South Fifth Street across from the CNG site. The balance of property uses in the vicinity of the CNG site are for commercial business, parking, or storage.

2.6 GEOLOGY

The CNG Facility is located in Southcentral Washington, within the Columbia Plateau physiographic region. The Region is underlain by basaltic rocks of the Columbia River Group of middle Miocene through early Pliocene age. Only the upper part of the Columbia River Group, the Yakima Basalt, is commonly exposed in the Yakima River basin. The Yakima Basalt has been warped and folded to form the principle topographic features of the region. Lacustrine and fluvial sediments of Pliocene age partly fill the structural basins formed through folding of the basalt sequence. These sediments consist of laminated silt, fine sand, and clay and of crossbedded sand and gravel. The Ellensburg Formation was laid down in the Yakima River Valley (La Sala, et al, 1973). Recent stream alluvium fills the stream valleys of the Yakima River basin. These deposits are composed chiefly of unconsolidated silt, sand, and gravel. In places, they exceed 500 feet in thickness (Kinnison and Sceva, 1963).

Facility geology was described as stratified layers of sandy silts, fine sand, and silt to the maximum depth explored of approximately 20 feet below ground surface during previous investigations. These sediments are typical of recent stream alluvium in the Yakima River basin.

2.7 HYDROGEOLOGY

Regional groundwater occurs in permeable zones and fractures, mainly under artesian conditions in the basaltic rocks, and in unconsolidated deposits under both watertable and artesian conditions. Groundwater recharge occurs primarily by infiltration of surface runoff from ridges that receive greater quantities of rainfall, and by loss of water from the Yakima River year round. During the late spring and summer months, irrigation contributes to groundwater recharge in the Yakima River basin. Within the City of Sunnyside area, the bulk of groundwater movement is towards the south, away from Rattlesnake Hills to the north, and toward the Yakima River to the south. The coarser grained members of recent stream alluvium have permeabilities as great as any geologic unit in the Yakima River basin, and serve as important aquifers in the area (Kinnison and Sceva, 1963).

Data developed during the RI/FS indicate that shallow groundwater conditions occur at the CNG Facility at depths of approximately 8 to 10 feet below ground surface. Groundwater appears to flow to the south/southwest under a gradient of approximately 0.008 to 0.01 feet per foot.

2.8 WATER SUPPLY WELLS

As illustrated in Figure 4, six water supply wells have been identified within approximately 0.25-mile of the CNG Facility. These include:

- Two City of Sunnyside water supply wells (No. 3 and No. 4) located approximately 800 feet northeast of the CNG Facility. Well No. 3 and No. 4 are completed at 1,162 feet and 1,576 feet below ground surface, respectively, and both yield groundwater at a rate of approximately 900 gallons per minute (Fink, 1992).

- Two City of Sunnyside water supply wells (No. 1 and No. 2) are located approximately 1,500 feet south of the CNG Facility. The No. 1 well is reportedly completed at a depth of 154 feet below ground surface. The No. 1 well has been determined to be contaminated with perchloroethylene and 1,1,2-trichloroethane, reportedly from nearby dry cleaning operations, and is no longer used for a water supply (Ecology, August 16, 1988). Well No. 2 is completed at approximately 1,400 feet below ground surface.

- One additional City of Sunnyside well (No. 5) is located approximately 1,300 feet west of the CNG Facility. Well No. 5 is completed at approximately 458 feet below ground surface.

- The *Old Creamery Well* is located approximately 500 feet south of the CNG Facility. Ecology reports that there is no well log record for this well, but believes that it is completed in the same aquifer as the No. 1 city well. The *Old Creamery Well* is no longer used to supply water (Cochran, Letter to Del Christenson of SECOR, March 9, 1992).

3.0 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

The following section provides a chronological summary of past environmental investigations at the CNG Facility in Sunnyside.

3.1 CHRONOLOGY OF INVESTIGATION

A chronological listing of pre-RI/FS investigative events are provided below:

- **September and October 1990:** Four USTs were removed from the CNG Facility. During the removal, petroleum hydrocarbons were determined to be present in on-site soil and groundwater. Approximately 1,400 cubic yards of petroleum-hydrocarbon containing soil were excavated and stockpiled on-site.

- **April 1991:** Ecology installed and sampled three groundwater monitoring wells as part of a Site Hazard Assessment of the CNG Facility. Petroleum hydrocarbons were identified in groundwater samples and in soil samples. A limited number of volatile and semi-volatile organic compounds were also detected in soil samples.

- **July 1991:** The 1,400 cubic yards of stockpiled soil were analyzed for waste characterization purposes and an assessment of disposal or treatment options. The three groundwater monitoring wells and water that had accumulated in the UST excavation were also sampled. Petroleum hydrocarbon constituents and 1,2-dichloroethane were detected in each of the three monitoring wells.

- **December 1991:** The three monitoring wells previously installed by Ecology were sampled. Petroleum hydrocarbon constituents were detected in samples from two of the three wells, and 1,2-dichloroethane was detected in samples from each of the three wells.

- **January 1992:** Approximately 700 cubic yards of additional soil were excavated. This soil, and the 1,400 cubic yards which had been excavated in July 1991, were transported to Terrace Heights Landfill near Yakima for bioremediation and subsequent disposal. The excavation was also backfilled.

An additional investigation was conducted by CNG in July of 1993 (pending issuance of the Agreed Order) to provide a preliminary assessment of potential petroleum hydrocarbon concentrations in the county drain, soil, and groundwater; and to evaluate whether immediate public health or environmental concerns existed. This additional investigation addressed several of the tasks which were later incorporated into the Agreed Order. Therefore, the additional investigation is discussed in Section 4.0 with the remedial investigation.

The results of each of these events are summarized below:

3.2 SEPTEMBER AND OCTOBER 1990

The four USTs at the CNG Facility were removed in September of 1990 by White Shield, Inc. (White Shield) of Grandview, Washington. White Shield was working as a subcontractor to E.P. Johnson Construction, Inc. of Kennewick, Washington. During removal of the USTs, petroleum hydrocarbons were discovered in soil and groundwater in the UST excavation. The excavation was extended laterally to remove the majority of petroleum hydrocarbon-affected soil present above the water table. Approximately 1,400 cubic yards of soil were excavated and stockpiled on-site. The resulting excavation was approximately 70 feet long by 55 feet wide at the ground surface, and was approximately 10 to 12 feet deep. A site map that depicts the excavation is presented on Figure 5.

White Shield collected a total of 44 soil samples from the excavation which were analyzed for petroleum hydrocarbon constituents. One soil sample was collected and analyzed for both total and Extraction Procedure Toxicity Protocol (EP-Tox) lead content. One soil sample was collected and analyzed for semi-volatile organic compounds. Ten soil samples were collected and analyzed for volatile organic compounds. One soil sample was collected and analyzed for pesticides and polychlorinated biphenyls (PCBs). A total of 10 soil samples from the stockpiled soil were collected and analyzed for petroleum hydrocarbons. In addition, one water sample from the excavation was collected and analyzed for petroleum hydrocarbons.

Analyses of the soil samples indicated that soil samples from each of the excavation sidewalls contained TPH in the gasoline and/or diesel ranges in excess of 1990 draft MTCA Method A soil cleanup levels. Several semi-volatile organic compounds were detected in a soil sample from approximately 6 feet below ground surface near the center of the excavation. The detected semi-volatile compounds included:

- Butyl benzylphthalate at 0.098 milligrams/kilogram (mg/kg);
- Dibenzofuran at 0.079 mg/kg;
- 2 Methylnaphthalene at 0.069 mg/kg;
- Naphthalene at 0.166 mg/kg; and
- Pentachlorophenol at 0.073 mg/kg.

Only the pentachlorophenol concentration exceeds the current (August 1994) MTCA Method B soil cleanup level of 0.0729 mg/kg, which is based on protection of groundwater. In addition, 1,2-dichloroethane was detected in two of the nine soil samples that were analyzed for volatile organic compounds at concentrations of 3 micrograms/kilogram (μg/kg) and 16 μg/kg. These concentrations do not exceed the current MTCA Method B soil cleanup level.

Lead was detected at a concentration of 4.65 mg/kg in the soil sample that was analyzed for lead content. Lead is a naturally occurring element in soil, and the reported concentration is well below the MTCA Method A soil cleanup level of 250 mg/kg. The lead concentration derived from the leachability test conducted pursuant to the EP Tox protocol was of non-detectable levels at a detection limit of 1.0 milligrams/liter (mg/L).

The water samples from the excavation was determined to contain 54 micrograms/liter (μg/L) of 1,2-dichloroethane which exceeds the 5 μg/L of MTCA Method A cleanup level and the 0.481 μg/L Method B cleanup level for groundwater. Pesticides, PCBs, and gasoline and diesel range TPH were not detected in the water samples from the excavation. Oil range TPH was detected at a concentration of 15 mg/L, which is in excess of the 1.0 mg/L MTCA Method A groundwater cleanup level.

The analytical results of the White Shield Investigation are summarized on Table 1. The corresponding excavation and sample locations are shown on Figure 5. White Shield documented their efforts in the *Draft Interim Status Report, Cascade Natural Gas Corp., Sunnyside, Washington* which was submitted to E.P. Johnson Construction, Inc. in November 1990.

3.3 APRIL 1991

In April of 1991, Ecology completed a Site Hazard Assessment at the CNG Facility, including installation of three shallow groundwater monitoring wells. Seven soil samples from the well borings were analyzed for volatile and semi-volatile organic compounds.

The well numbers assigned by Ecology to wells MW-3 and MW-1 were subsequently changed by SECOR to well numbers MW-1 and MW-3, respectively. All well references in the Site Hazard Assessment (including text, tables, and figures) indicate that well MW-1 is near the southwest corner of the CNG site and well MW-3 is near the center of the CNG site. All subsequent references by SECOR and the Agreed Order are based on the changed locations (MW-3 near the southwest corner and MW-1 near the center of the site).

The soil sample from monitoring well MW-1 (now referred to as MW-3) contained benzene in excess of MTCA Method A soil cleanup levels. No other soil samples contained analytes at concentrations in excess of the Method A soil cleanup levels. The following analytes were detected in one or more of the soil samples:

- Benzene
- Ethyl Benzene
- Toluene
- Total Xylenes
- Naphthalene
- 2-Methylnaphthalene
- Bis(2-ethylhexyl)phthalate
- Butylbenzylphthalate
- Di-n-octylphthalate
- Diethylphthalate
- Di-n-butylphthalate
- Acetone
- Methylene Chloride
- 1,1-Dichloroethane
- 1,1,1,-Trichloroethane

The groundwater sample from monitoring well MW-1 contained 51 μg/L of benzene (in excess of the MTCA Method A groundwater cleanup level of 5 μg/L). No other analytes were detected in the groundwater samples. Analytical results of soil and groundwater samples collected during the Site Hazard Assessment are summarized on Table 2 of this report.

Subsurface soils were logged as consisting of stratified silty sand and silt. Groundwater elevations measured during monitoring and sampling indicated a flow direction to the southwest. The maximum depth of the borings completed as part of this effort was 20 feet below the ground surface.

The location of the borings are shown on Figure 2 in this report.

3.4 JULY 1991

In July 1991 SECOR collected a total of 39 samples from the soil that was stockpiled on the site in 1990 by White Shield. The soil samples were analyzed for TPH in the gasoline and diesel ranges, benzene, toluene, ethyl benzene, and total xylenes. Ten of the soil samples were also analyzed for pentachlorophenol. The analytical results were reviewed to assess potential disposal options.

SECOR also collected groundwater samples from each of the three on-site monitoring wells and the UST excavation pit. The water samples were analyzed for TPH in the gasoline and diesel ranges, benzene, toluene, ethyl benzene, total xylenes and for halogenated volatile organic compounds.

Laboratory data indicated that 24 of the 39 soil samples collected from the stockpiled soil contained concentrations of TPH in the diesel range greater than the 200 mg/kg Method A cleanup level established by the MTCA. Concentrations of TPH in the gasoline range were above the MTCA Method A cleanup level (100 mg/kg) in 24 of the 39 samples analyzed. Cleanup levels established for benzene, toluene, ethyl benzene, and total xylenes were exceeded in only one of the 39 soil samples collected at the site. Pentachlorophenol was detected in only one of the 10 soil samples analyzed, at a concentration of 0.03 mg/kg. This concentration is below the MTCA Method B Soil Cleanup Level for protection of groundwater (0.0729 mg/kg).

The groundwater sample collected from MW-3 had detectable concentrations of TPH in the gasoline range and benzene, above their respective MTCA Method A cleanup levels for groundwater. Groundwater samples from MW-1 and MW-2 did not contain petroleum hydrocarbon analytes in excess of MTCA Method A cleanup levels. 1,2-dichloroethane was detected in each of the groundwater monitoring well samples. The concentration of 1,2-dichloroethane in the samples from monitoring wells MW-1 and MW-3 exceeded the MTCA Method A groundwater cleanup level of 5 μg/L. No other volatile analytes were detected. Two water samples were collected from the standing water in the excavation. TPH in the diesel range (at 1,700 μg/L in one of the samples) was the only detected analyte in excess of MTCA Method A cleanup levels in the water samples from the excavation. The analytical results of laboratory analyses conducted during this sampling event are summarized on Table 3.

3.5 DECEMBER 1991

On December 17, 1991 SECOR collected groundwater samples from the three monitoring wells previously installed on the CNG Facility. The water samples were analyzed for TPH in the gasoline and diesel ranges, benzene, toluene, ethyl benzene, total xylenes, and halogenated volatile organic compounds. Results of the analyses indicated that the water sample from well MW-3 contained concentrations of TPH in the gasoline and diesel ranges, benzene, toluene, ethyl benzene, total xylenes, and 1,2-dichloroethane in excess of MTCA Method A groundwater cleanup levels. The water sample from well MW-1 also contained 1,2-dichloroethane in excess of Method A cleanup levels. All other analytes were either not detected or were detected below MTCA cleanup levels. Methylene chloride was detected at a concentration of 26 μg/L in the sample from monitoring well MW-3. This compound is a common laboratory contaminant. The laboratory report notes that methylene chloride was believed to be a laboratory artifact. The results of this sampling event were documented by SEACOR in a March 24, 1992 letter report titled *Results of Recent Groundwater Sampling, Cascade Natural Gas Facility, Sunnyside, Washington.* The analytical results are summarized on Table 3 of this report.

3.6 JANUARY 1992

On January 6 and 7, 1992 SECOR supervised the excavation of approximately 700 cubic yards of additional petroleum-impacted soil from the east, west, and north sidewalls of the UST excavation. The additional excavation extended from the ground surface to a depth of approximately 8 feet. Unstable saturated soil conditions due to presence of groundwater prohibited deeper excavation. The excavated soil was temporarily stockpiled at the CNG Facility, characterized for proper disposition, and transported to the Terrace Heights Landfill for landfarming and subsequent disposal. The UST excavation was backfilled with pit run material obtained from the Snipes Mountain Gravel Pit, located approximately 6 miles southwest of Sunnyside. Two representative samples of the backfill material were analyzed for total petroleum hydrocarbon identification by North Creek Analytical of Bothell, Washington. The analytical results reported that neither TPH in the gasoline range nor TPH in the diesel range were present at detectable concentrations.

A total of 17 soil samples were collected from the excavation and were submitted for chemical analyses to assess the effectiveness of the remediation effort. A total of 10 soil samples were collected from the base of the north, west, and east sidewalls of the final excavation. One soil sample (an intermediate soil sample) was also collected from a sidewall before the excavation was completed. The sampling location was subsequently excavated when the perimeter of the excavation was expanded to its final extent. A total of six soil samples were collected from the limited area of the bottom of the excavation that was not under water. As indicated previously, eight soil samples were collected from the stockpiled excavated soil to characterize the soil for disposal purposes. The locations of the soil samples are shown on Figure 6.

All soil samples were submitted to North Creek Analytical for analysis of TPH in the gasoline and diesel ranges, benzene, toluene, ethyl benzene, and total xylenes. In addition, one of the excavation sidewall samples was analyzed for semi-volatile organic compounds. Two of the stockpile soil samples were also analyzed for volatile and semi-volatile organic compounds. The analytical results are summarized on Table 4.

The soil samples from the final excavation sidewalls did not contain concentrations of TPH in the diesel or gasoline ranges, benzene, toluene, ethyl benzene, or total xylenes in excess of MTCA Method A soil cleanup levels. Soil samples from the bottom of the excavation contained one or more of TPH constituents in the diesel range, TPH in the gasoline range, benzene, ethyl benzene, or total xylenes in excess of MTCA Method A soil cleanup levels.

The intermediate sidewall soil sample contained TPH in the diesel and gasoline ranges, ethyl benzene, and total xylenes in excess of MTCA Method A soil cleanup levels. The intermediate sidewall soil sample also contained detectable concentrations of isophorone, 2-methylnaphthalene, naphthalene, and phenanthrene. Method A cleanup levels have not been established for these compounds. The reported concentrations of naphthalene and phenanthrene exceeded the MTCA Method B soil cleanup levels based on protection of groundwater. The concentration of isophorone did not exceed MTCA Method B cleanup levels. A cleanup level for 2-methylnaphthalene has not been established under MTCA Method A or B cleanup criteria.

Four of the samples of the stockpiled soil contained concentrations of TPH in the diesel and/or gasoline ranges in excess of MTCA Method A soil cleanup levels. Concentrations of benzene, toluene, ethyl benzene, and total xylenes did not exceed MTCA Method A cleanup levels. The two samples of stockpiled soil that were also analyzed for volatile and semi-volatile organic compounds contained detectable concentrations of acetone, methylene chloride, isophorone, 4 methylphenol, and phenanthrene. The laboratory report noted that methylene chloride and acetone in the stockpile soil samples were suspected laboratory contaminants. The reported concentration of isophorone did not exceed the established MTCA Method B soil cleanup levels. MTCA does not establish a cleanup level for 4-methylphenol.

3.7 SUMMARY

The analytical results of soil samples collected during the initial excavation in September and October of 1990, and the final excavation in January of 1992, indicate that TPH-containing vadose zone soil has been successfully removed from the site. The concentrations of TPH in the diesel and gasoline ranges, benzene, toluene, ethyl benzene, and xylenes in the sidewalls of the final excavation did not exceed MTCA Method A soil cleanup levels in the north, west, or east sidewalls. Further, the results of the sampling and analyses conducted during the initial excavation in September and October 1990 indicate that the remaining vadose zone soil downgradient (south) of the UST excavation did not contain elevated concentrations of TPH constituents.

Analyses of groundwater samples from on-site monitoring wells identified the presence of TPH in the diesel range, benzene, toluene, ethyl benzene, and total xylenes in excess of MTCA Method A groundwater cleanup levels at well location MW-3, downgradient of the former UST location at the CNG site. The same analytes have also been detected in one of the three groundwater samples that have been collected from monitoring well MW-1; however, benzene, toluene, ethyl benzene, and total xylenes did not exceed the MTCA Method A cleanup levels; and only the combined concentrations of TPH in the diesel and gasoline ranges exceeded the MTCA Method A groundwater cleanup level of 1,000 μg/L.

Two of the three groundwater samples which were collected from well MW-2 (upgradient of the former UST location) contained detectable concentrations of 1,2-dichloroethane and TPH in the gasoline range, but neither constituent exceeded established MTCA groundwater cleanup levels. 1,2-dichloroethane has been detected in all three of the on-site monitoring wells. The source of the 1,2-dichloroethane in the on-site monitoring wells has not been identified. The presence of this compound in well MW-2, which is near the northern (upgradient) property boundary, strongly suggests a potential off-site source of 1,2-dichloroethane.

The analytical data to assess the extent of the dissolved petroleum hydrocarbons, volatile, and semi-volatile organic compounds in groundwater in the vicinity of the CNG Facility were not available. Similarly, analytical data were not available to assess the potential impacts (if any) on the adjacent county drain under East Decatur Avenue or the sanitary sewer under South Fifth Street. In response to these data gaps, the RI/FS Work Plan was developed and the Agreed Order was written to implement plan.

4.0 REMEDIAL INVESTIGATION

SECOR RI/FS field activities were conducted in accordance with the July 23, 1992 *Revised Work Plan for Remedial Investigation and Assessment of Groundwater Alternatives* (SEACOR, July 1992) as amended by:

- *Addendum No. 1 to the Revised Work Plan and Assessment of Groundwater Remedial Alternatives for Cascade Natural Gas Corporation* (SEACOR, October 16, 1992);
- *Modifications to Revised Work Plan for Remedial Investigation and Assessment of Groundwater Remedial Alternatives for Cascade Natural Gas Corporation* (SEACOR, March 15, 1993); and
- *Exhibit A Addendum Remedial Investigation and Assessment of Groundwater Remedial Alternatives* (SEACOR, January 21, 1994).

The July 1992 Work Plan contained detailed descriptions for conducting field procedures and chemical analyses methods as follows:

- Unified Soil Classification System, Appendix A;
- Aquifer Testing Procedures, Appendix B;
- Well Drilling and Soil Sampling Methods, Appendix C;
- Groundwater Monitoring Well Development and Sampling, Appendix D; and
- Equipment Decontamination, Appendix E;

Analytes and analytical methods are specified in Section 2.5 of the July 1992 Work Plan and in Table A.2 of the January 21, 1994 Exhibit A Addendum.

4.1 SCOPE OF WORK

Based on review of available data from the previous investigations described in Section 3.0 of this document, a scope of work was developed to conduct a remedial investigation. The scope of work is detailed in the Work Plan and addenda noted above which are incorporated into Agreed Order DE94TC-C165.

In accordance with the amended scope of work, seven primary tasks were specified:

- Task 1 - Survey existing wells and pertinent on and off-site reference points;
- Task 2 - Assess water levels in on- and off-site wells and drains;
- Task 3 - Assess the county drain and surrounding backfill;

- Task 4 - Install groundwater monitoring wells and conduct aquifer tests;
- Task 5 - Sample monitoring wells and analyze groundwater samples;
- Task 6 - Identify data gaps and remedial action alternatives;
- Task 7 - Prepare a focused RI/FS report for CNG submittal to Ecology.

The October 16, 1992 Addendum No. 1 to the Work Plan specified two scenarios for completing the site investigation based on the results of groundwater analyses conducted during Task 5.

4.1.1 Scenario No. 1

Scenario No. 1 was to be implemented in the event that groundwater samples from RI/FS groundwater monitoring wells MW-7 and MW-8 did not contain TPH in the diesel or gasoline ranges, benzene, toluene, ethyl benzene, or total xylenes in excess of MTCA Method A groundwater cleanup levels. Monitoring wells MW-7 and MW-8 were to be installed south (downgradient) of the county drain. Under Scenario No. 1 the following actions were to be conducted:

- No aquifer testing (as described in Task 4) would be performed;
- No feasibility study, as described in Task 7, would be required;
- In lieu of a feasibility study, a groundwater monitoring program would be implemented at the site. The monitoring program would include measuring water levels in all wells at the site, and collecting water quality samples from selected monitoring wells at quarterly intervals for a 3-year period; and
- If, at the end of the 3-year monitoring period, the concentrations of the chemicals of concern in the wells selected for monitoring remain below MTCA Method A cleanup levels, the CNG site would be considered closed and no further action would be taken.

4.1.2 Scenario No. 2

Scenario No. 2 was to be implemented in the event that water samples from monitoring wells MW-7 and MW-8 contained TPH in the diesel or gasoline ranges, benzene, toluene, ethyl benzene, or total xylenes in excess of MTCA Method A cleanup levels. Under Scenario No. 2 the following actions were to be completed:

- An aquifer test would be performed in accordance with Task 4;
- A focused feasibility study would be prepared as described in Task 7. As part of the feasibility study, a risk assessment would be performed for all constituents of concern detected in selected monitoring wells which are in excess of MTCA Method A Cleanup Levels. This risk assessment would be performed to develop cleanup objectives in accordance with Method B protocols (as described in WAC 173-340-720).

- If the concentrations of all analyzed constituents of concern in wells selected for monitoring were determined to be below Method B cleanup levels, a monitoring program would be implemented as specified in Scenario 1, except that results would be compared to the calculated Method B Cleanup Levels. If concentrations of all analyzed constituents of concern in wells selected for monitoring remain below the calculated MTCA Method B cleanup levels for a period of three years, the site would be considered closed and no further action would be taken;
- If the concentration of any analyzed constituent of concern in wells selected for monitoring was determined to be above its respective Method B cleanup level, alternatives for groundwater remediation would be evaluated in the feasibility study and a remedial action plan for the site would be developed.

The results of the remedial investigation indicated that scenario No. 1 was applicable. The actions under Scenario No. 1 are presented below.

4.2 REMEDIAL INVESTIGATION RESULTS

The results of the remedial investigation are discussed below.

4.2.1 Geology

Findings regarding site geology are based on review of the three boring logs for wells completed during the Site Hazard Assessment, and the eight well borings completed during this RI. Boring logs from previous investigations and the RI are provided in Appendix B.

The maximum depth of any boring completed during the RI and preceding investigations at the CNG Facility was 20 feet below ground surface. The soil encountered to that depth consisted of stratified non-indurate sand, silty sand, silt, and sandy silt. These sediments are typical of alluvial deposits. Significant discontinuities were observed in the subsurface soils encountered during the investigation. The absence of reasonably correlatable geologic layers or units within the shallow depths explored during the investigation precluded the development of meaningful geologic cross sections for the investigation area.

4.2.2 Hydrogeology

Contours of the July 22, 1993 and July 16, 1994 water levels indicate that first encountered groundwater at the site generally flows to the south/southwest at a gradient of approximately 0.008 to 0.01 feet per foot (ft/ft) (Figure 7).

First encountered groundwater at the site exists under unconfined conditions at approximately 8 to 11 feet below ground surface in silt, sandy silt, and silty sand. The groundwater surface appears to be depressed in the immediate vicinity of the county drain that underlies East Decatur Avenue.

The hydraulic gradient in the immediate vicinity of the county drain is significantly greater at approximately 0.08 ft/ft. The observed water levels in the groundwater monitoring wells and the county drain indicate that the county drain is effectively dewatering the uppermost zone of the aquifer, which results in a depressed groundwater table in the immediate vicinity of the Drain. The

Drain was designed and installed to accomplish this objective when it was constructed. In turn, the depressed water table is likely to affect flow conditions in the upper portion of the aquifer in the immediate vicinity of the Drain. Comparison of water levels in July and October reveal a water table fluctuation of less than 1 foot.

4.2.3 Results of Soil Analyses

A summary of soil analytical results for samples collected during the RI is presented on Table 5. The soil samples were collected from the well borings in accordance with the protocols presented in Appendix C of the July 1992 Work Plan. Chemical analyses were conducted in accordance with the July 1992 Work Plan and the January 1994 Exhibit A Addendum as applicable. The soil samples analyzed from well borings MW-6 through MW-11 did not contain detectable concentrations of TPH in the diesel or gasoline ranges, benzene, toluene, ethyl benzene, total xylenes, or volatile or semi-volatile organic compounds.

The soil samples from well MW-4 (west of the CNG site) contained 3.7 mg/kg of TPH in the gasoline range, 0.54 mg/kg of benzene, and 0.079 mg/kg of ethyl benzene. Of these analytes, only benzene exceeded the MTCA Method A soil cleanup level.

The soil sample from well MW-5 (located west of the southwest corner of the CNG site) contained 78 mg/kg TPH in the gasoline range, 0.12 mg/kg ethyl benzene, and 0.15 mg/kg xylenes. None of these analytes exceeded their respective MTCA Method A cleanup levels.

The analytical methods are also shown on Table 6. The sample from the 4.5 to 5-foot depth interval from well MW-9 contained a reported 5.2 mg/kg of pentachlorophenol. This was the only soil sample from the July 1994 RI investigation that contained a detectable semi-volatile organic compound. A Method A cleanup level is not established for pentachlorophenol. Although the concentration does exceed the 0.0729 mg/kg Method B cleanup level based on protection of groundwater, the reported concentration does not exceed the Method B soil cleanup level of 8.33 mg/kg based on exposure to soil. The soil sample from 10.5 to 11-feet deep in boring MW-9 did not contain detectable concentrations of pentachlorophenol.

4.2.4 Groundwater Analytical Results

A summary of water sample analytical results is presented on Table 6. Water level data are summarized on Table 7. Water samples from wells MW-2, MW-6, MW-7, MW-8, MW-10, and MW-11 did not contain detectable concentrations of TPH in the diesel or gasoline range, benzene, toluene, ethyl benzene, or total xylenes. Wells MW-3, MW-4, and MW-5 contained one or more of TPH in the diesel or gasoline ranges, benzene, toluene, ethyl benzene, or total xylenes in excess of MTCA Method A groundwater cleanup levels.

1,2-dichloroethane was detected in water samples from wells MW-1, MW-3, MW-4, MW-9, MW-10, and MW-11. The concentration in the water sample from well MW-10 did not exceed the MTCA Method A cleanup level of 5 μg/L. The concentration of 1,2-dichloroethane in the water samples from wells MW-1, MW-3, MW-4, MW-9 and MW-11 did exceed the MTCA Method A cleanup level. The Work Plan did not include sampling water from the county drain in July 1994. However, upon review of the July 1994 analytical results, CNG and Ecology agreed that supplemental water samples would be collected from the CD-West and CD-East manholes in the county drain beneath Decatur Avenue and from well MW-3 (upgradient of the county drain) to assess current water quality in the drain. The drain and well MW-3 were resampled by SECOR on August 5, 1994. Acetone was detected in the August 5, 1994 sample from well MW-3. The reported concentration of acetone in the MW-3 water sample (51 $\mu g/L$) was well below the MTCA Method B cleanup level of 800 $\mu g/L$. A Method A cleanup level has not been established for acetone. The results for the water samples from the county drain are discussed in Section 4.2.5 of this report.

Two semi-volatile organic compounds (2-methynaphthalene and naphthalene) were detected in the July 1994 water sample from well MW-3. Numeric cleanup levels have not been by MTCA for 2-methylnaphthalene. The reported concentration of naphthalene (120 $\mu g/L$) established the MTCA Method B cleanup level of 32 $\mu g/L$. A Method A cleanup level has not been established for naphthalene.

It should be noted that none of the analyzed constituents were detected in any of the three wells (MW-6, MW-7 and MW-8) that are south of the county drain beneath East Decatur Avenue.

4.2.5 County Drain and Sanitary Sewer Water Results

The county drain near the CNG site is accessible through two manholes (CD-East and CD-West shown on Figure 7). The drain flows east to west beneath East Decatur Avenue. Manhole CD-West is near the southwest corner of the CNG site and is downgradient of monitoring well MW-3. Manhole CD-East is south of the southeast corner of the CNG site and is also upgradient of manhole CD-West. Water samples were collected from the county drain in July of 1993 and in August of 1994. In both events, the concentrations of detected analytes were higher in the sample from CD-West than from CD-East. Only benzene and ethyl benzene have been detected in the water samples from the county drain. None of the reported concentrations of these compounds have exceeded either MTCA Method A or B Surface Water Cleanup Levels, U.S. Environmental Protection Agency (EPA) 1992 Water Quality Criteria values for Freshwater Acute Exposure for aquatic organisms or the Human Health Criteria Levels for exposure associated with consumption of fish from potentially contaminated water. A summary of water sample analyses is provided on Table 6.

Infiltrating groundwater is believed to be the primary source of water in the county drain. The concentrations of the detected semi-volatile compounds (2-methylnaphthalene and naphthalene) in wells MW-3 and MW-11 did not exceed available EPA 1992 Water Quality Criteria Levels or MTCA Method B Cleanup Levels for Ground surface Water; therefore, it is implausible that groundwater infiltration from the CNG site could produce concentrations of either semi-volatile compound in the county drain in excess of these criteria levels. As such, the water samples from the county drain were not tested for semi-volatile organic compounds.

4.2.6 Additional Potential Source Areas

Groundwater analytical results for groundwater samples collected during the RI from two of the upgradient monitoring wells (wells MW-9 and MW-10) report the presence of detectable concentrations of TPH in the diesel and gasoline ranges (in well MW-9) and 1,2-dichlorethane (in wells MW-9 and MW-10). Well MW-9 is located near the eastern property boundary approximately 60 feet upgradient of the former UST locations, and well MW-10 is located on the west side of South Fifth Street, approximately 150 feet cross-gradient from the former UST locations (Figure 7). In addition, TPH in the gasoline range and 1,2-dichloroethane was detected in water samples collected from well MW-2 (located approximately 100 feet upgradient of the former UST location) on July 2, 1991 and December 17, 1991, respectively.

A review of the analytical data from water samples obtained from the County Drain beneath East Decatur Avenue, and from the sanitary sewer beneath South Fifth Street, also suggests the presence of potential off-site source(s) of TPH constituents to the county drain and sanitary sewer systems in the vicinity of the CNG site. TPH in the diesel range was detected during the July 1994 sampling event in the water sample from Manhole 1 (MH-1) within the sanitary sewer beneath South Fifth Street. The sanitary sewer flows from north to south at this location. Ethyl benzene was detected in the water sample obtained from the east county drain manhole (shown as CD-East on Figure 7) during the July 1993 sampling event. The county drain flows from east to west beneath East Decatur Avenue.

A Shell service station is adjacent to the east property boundary of the CNG site. The Tom Denchel Ford County automobile dealership is also located adjacent to the east boundary of the CNG site. Based on site observations of dispensing pumps and/or apparent UST vent lines, both the Shell and Tom Denchel facilities appear to have USTs; however, these two facilities are not shown in Ecology's January 27, 1994 list of registered UST sites or Ecology's list of leaking USTs in the Sunnyside zip code area.

4.3 REMEDIAL INVESTIGATION SUMMARY

Based on a review of well logs obtained during the previous investigations and a review of City of Sunnyside utility maps, the local shallow groundwater is not used for drinking water. There are no reported active water wells in the vicinity of the CNG site that are completed in the shallow aquifer and the area is served by the Municipal Water System. Therefore, there is no apparent exposure to groundwater in the vicinity of the CNG site.

None of the tested analytes were detected in any of the groundwater or soil samples collected from monitoring wells MW-6, MW-7, and MW-8 located south of the county drain and downgradient of the CNG site. Groundwater samples from wells MW-7 and MW-8 did not contain TPH constituents in excess of MTCA Method A cleanup levels and therefore, in accordance with specified scope of work under Scenario No. 1, aquifer testing and a feasibility study were not required. In addition, none of the soil samples collected during this RI contained TPH in the diesel or gasoline ranges in excess of MTCA Method A soil cleanup levels. Only one soil sample (from well MW-4 at 9.5 feet below ground surface) contained any volatile organic compound (benzene) at a concentration in excess of the MTCA Method A soil cleanup level. Benzene in this sample exceeded the 0.50 mg/kg Method A cleanup level by only 0.04 mg/kg.

Ethyl benzene and benzene are the only two analytes that have been detected in the water samples from the county drain adjacent to the CNG site. The concentrations of these two analytes did not exceed EPA or MTCA Surface Water Quality Criteria for applicable acute and/or chronic exposure for aquatic organisms, or for human health risks associated with consumption of fish from potentially contaminated waters.

The analytical results of soil and water samples from well MW-11 and water samples from the county drain indicates that there are no significant concentrations of TPH constituents or semi-volatile organic compounds in the southeast area of the CNG site. Although the water sample from well

MW-11 did contain 1,2-dichloroethane in excess of MTCA groundwater cleanup levels, there was none detected in the county drain or well MW-8 which are both downgradient of well MW-11.

Based on the water level data, analytical results of monitoring well soil and groundwater samples, and analytical results of county drain water samples collected during this RI, TPH constituents, volatile organic compounds and semi-volatile organic compounds are not migrating south of the county drain beneath East Decatur Avenue. The analytical and water level data developed during this RI provides strong evidence that the county drain is sufficiently intercepting and/or affecting the flow of water in the upper portion of the aquifer and is preventing downgradient migration of constituents in groundwater. In addition, groundwater which is infiltrating into the Drain does not appear to cause significant chemical concentrations in the water which flows through the county drain.

The data do not suggest the presence of a source of TPH constituents upgradient of well MW-10. Nor does there appear to be an off-site source for the TPH constituents identified in soil and water samples obtained from wells MW-4 and MW-5 which are located downgradient of the CNG site.

1,2-dichloroethane was detected during the RI in water samples from two upgradient monitoring wells (MW-10 and MW-9) and in other on-site/downgradient wells. Well MW-10 is an off-site upgradient well. Well MW-9 is located on-site and adjacent to the eastern upgradient property boundary. The presence of 1,2-dichloroethane in these two wells and in well MW-2 during previous investigations indicates that one or more off-site sources of 1,2-dichloroethane may be contributing to the observed concentrations in other on-site/downgradient monitoring wells during this RI and previous investigations.

Pentachlorophenol was not detected during this RI in any groundwater samples on or in any soil samples collected near the water table. Therefore, the observed concentration of pentachlorophenol in the vadose zone soil sample from well MW-9 appears to be immobile, has not migrated downward through the soil, and has not contributed to degradation of local groundwater quality.

In summary, the initial and subsequent remedial excavations conducted in 1990 and 1992 appear to have adequately removed the vadose zone TPH-containing soil from the site. This excavation has effectively removed the on-site source of TPH constituents.

The effects of the county drain beneath East Decatur Avenue are preventing downgradient migration of impacted groundwater beyond the county drain. Water quality in the county drain does not exceed EPA or MTCA Surface Water Quality Criteria for aquatic organisms or human consumption of fish.

The local shallow aquifer is not used for water supply purposes and the area is served by the Municipal water supply system. Therefore, there is no exposure to contaminated groundwater.

5.0 CONCLUSION AND RECOMMENDED ACTION

The data developed during the previous investigations and this RI support the implementation of Scenario No. 1 as defined in the Agreed Order. In accordance with terms of the Order, and as appropriate based on the results of the RI, the following actions are to be taken:

- Initiate a monitoring program to assess groundwater flow direction and groundwater quality at selected wells on a quarterly basis for three years; and

- The CNG site will be considered closed and no further action will be taken if, at the end of the three-year monitoring period, the concentrations of the chemicals of concern in the wells selected for monitoring remain below MTCA Method A cleanup levels.

SECOR recommends monitoring water levels in wells MW-1 through MW-11, well UTC-4, and in the county drain at manholes CD-West and CD-East on a quarterly basis. We also recommend collecting water samples from wells MW-6, MW-7, and MW-8 on a quarterly basis for analysis of TPH in diesel and gasoline ranges and for the following suite of volatile organic compounds:

- Benzene
- Toluene
- Ethyl Benzene
- Xylenes

We also recommend that the water samples from wells MW-6, MW-8, and MW-10 also be analyzed for 1,2-dichloroethane on an annual basis.

6.0 REFERENCES

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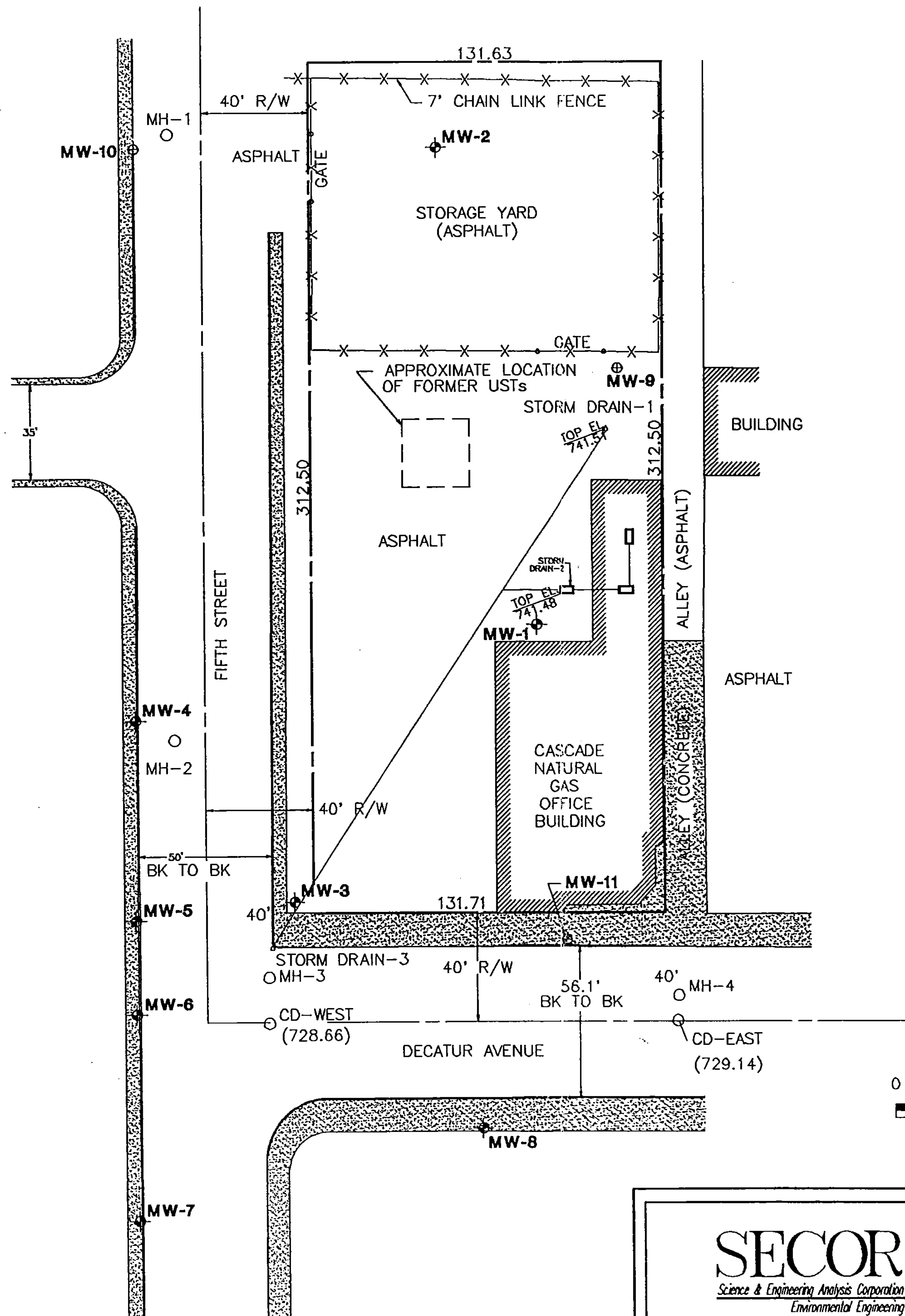
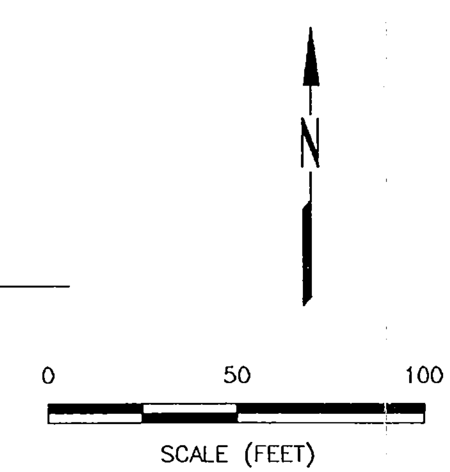




REFERENCE ELEVATIONS

FEATURE	ELEVATION	FEATURE	ELEVATION
MW-1	741.77	MH-1	741.55
MW-2	742.40	MH-2	741.29
MW-3	740.99	MH-3	741.16
MW-4	740.78	MH-4	742.05
MW-5	740.61	CD-WEST	741.46
MW-6	740.70	CD-EAST	742.22
MW-7	740.59	STORM DRAIN-1	741.51
MW-8	741.00	STORM DRAIN-2	741.48
MW-9	742.37	STORM DRAIN-3	740.48
MW-10	741.32		
MW-11	741.47		
MW-UTC-4	740.19		

NOTE: WELL ELEVATIONS ARE TO TOP OF PVC CASING

LEGEND

- CD-EAST — COUNTY DRAIN MANHOLE
- MH-1 — EXISTING MANHOLE
- MW-6 — EXISTING MONITORING WELL
- MW-10 — PROPOSED MONITORING WELL (LOCATIONS CONTINGENT ON UTILITY CLEARANCE)
- EXISTING FENCE
- PROPERTY BOUNDARY
- CONCRETE PAVEMENT OR SIDEWALK

MW-UTC-4

NOTE:
ELEVATION DATUM ESTABLISHED FROM U.S.C. & G.S. BRASS DISK IN THE NORTHEAST CORNER OF CITY HALL BUILDING HAVING AN ELEVATION OF 742.77

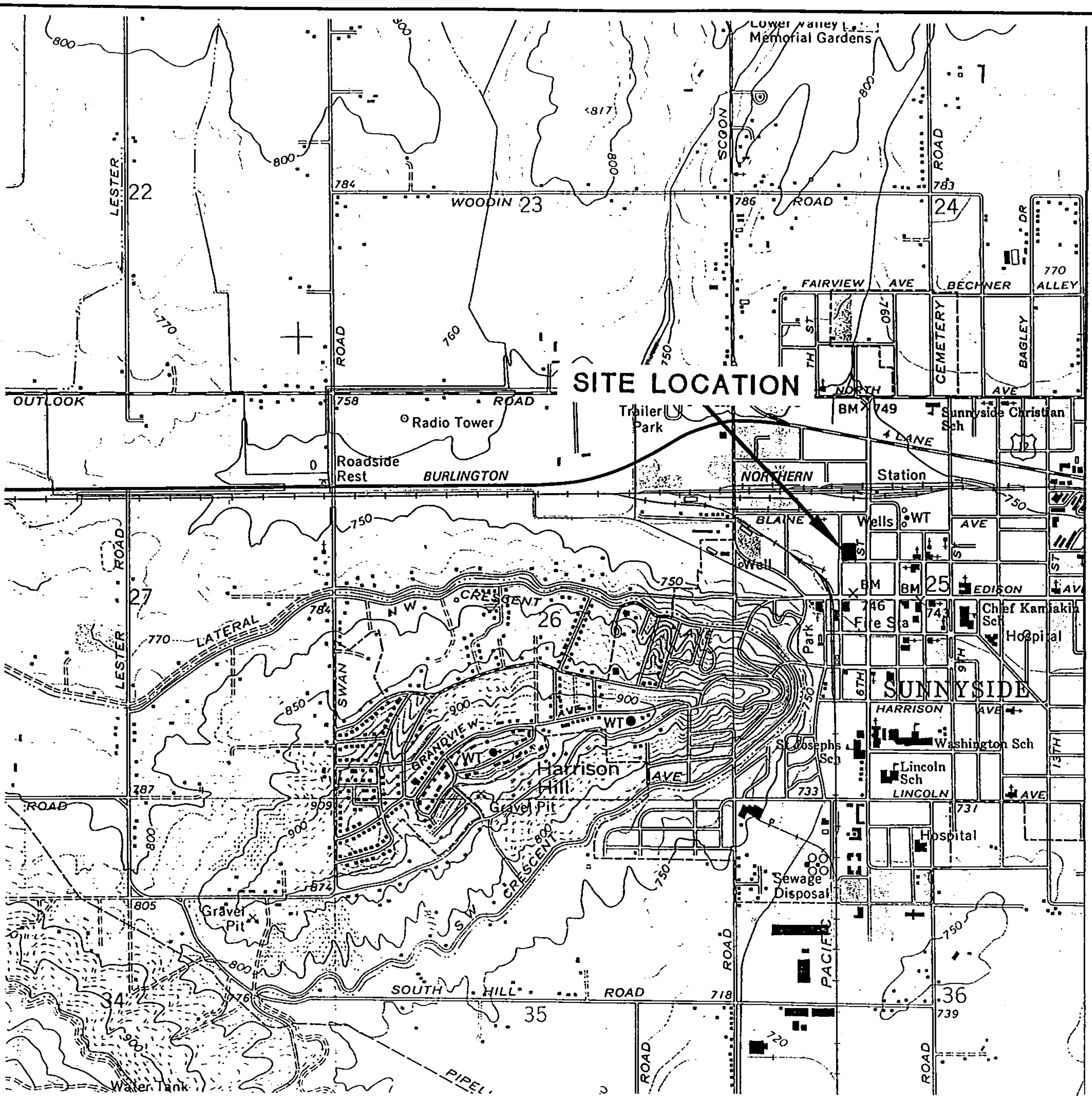
REFERENCE: PLSA ENGINEERING-SURVEYING-PLANNING YAKIMA, WASHINGTON (509) 575-6990 & CASCADE NATURAL GAS CORPORATION

SECOR
Science & Engineering Analysis Corporation
Environmental Engineering

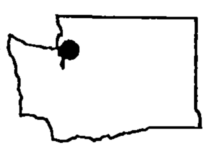
DWN L.Y.
APPR
DATE 9/28/94
JOB# C0902
00058-019-01

FIGURE 2
SITE PLAN
CASCADE NATURAL GAS
512 EAST DECATUR AVENUE
SUNNYSIDE, WASHINGTON

DWG:CNG1905B



REFERENCE: USGS 7.5 MINUTE QUADRANGLE MAP, SUNNYSIDE, WASHINGTON, 1978



WASHINGTON

N

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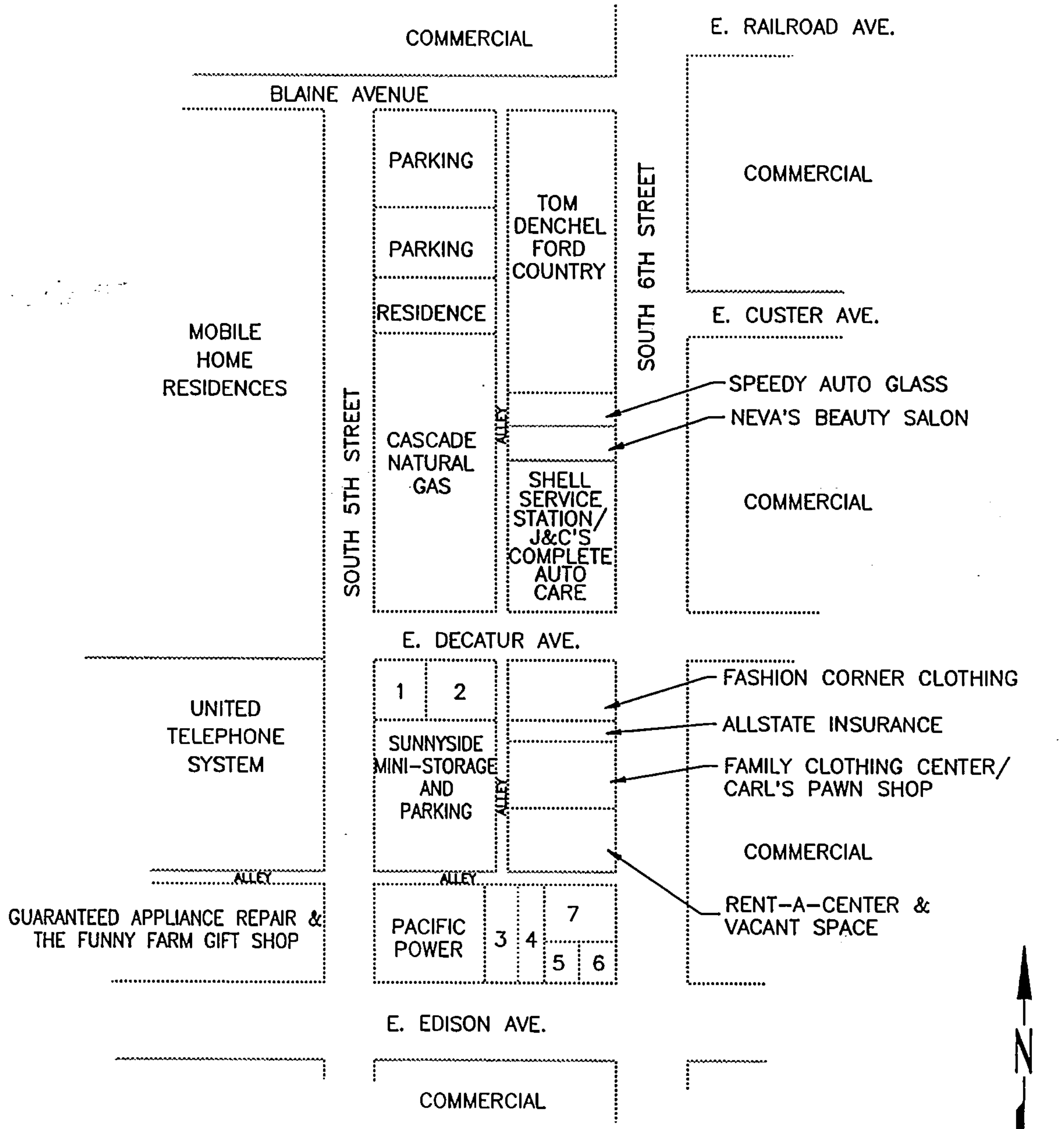
SCALE (MILES)

SECOR Science & Engineering Analysis Corporation Environmental Engineering	DWN L.Y. APPR DATE 9/29/94 JOB# C0902 00058-019-01	**FIGURE 1** **SITE LOCATION MAP** **CASCADE NATURAL GAS** **512 EAST DECATUR AVENUE** **SUNNYSIDE, WASHINGTON**

DWG:CNG1913M



1. SUNBURST VIDEO RENTAL SALES
2. YAKIMA HERALD-REPUBLIC NEWSPAPER
3. ONE STOP IMMIGRATION AND CENTRO EDUCATION
4. DAILY SUN NEWS CIRCULATION DEPARTMENT
5. PRIMO BUILDERS
6. CENTURY 21 VALLEY INVESTMENT PROPERTIES
7. CRAFTERS MALL

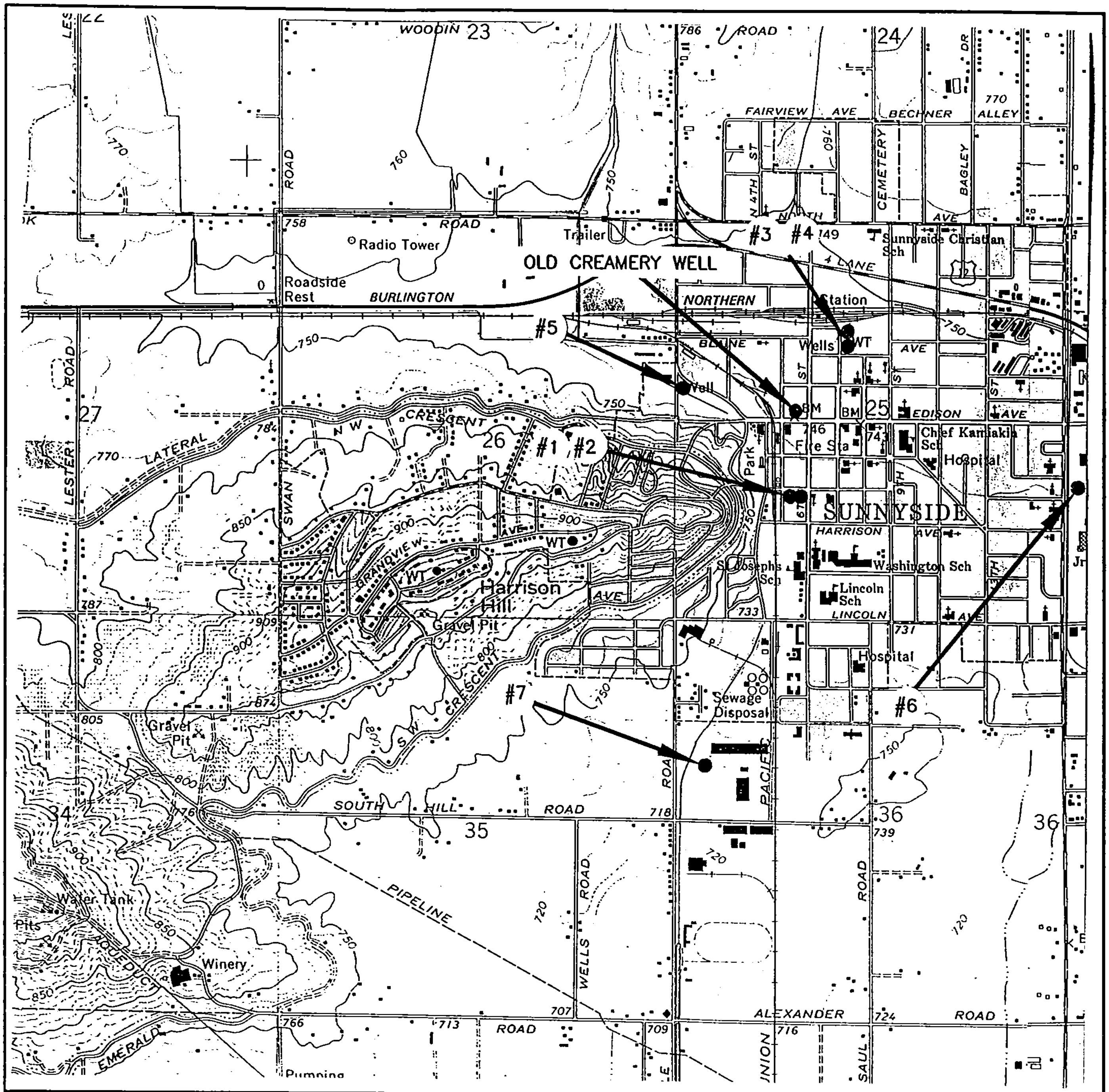
NOT TO SCALE

SECOR
Science & Engineering Analysis Corporation
Environmental Engineering

DWN L.Y.
APPR
DATE 9/28/94
JOB# C092
00058-019-01

FIGURE 3
LAND USE
CASCADE NATURAL GAS
512 EAST DECATUR AVENUE
SUNNYSIDE, WASHINGTON

DWG:CNG1906A



REFERENCE: DEPARTMENT OF ECOLOGY, 1988

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SCALE (MILES)

SECOR
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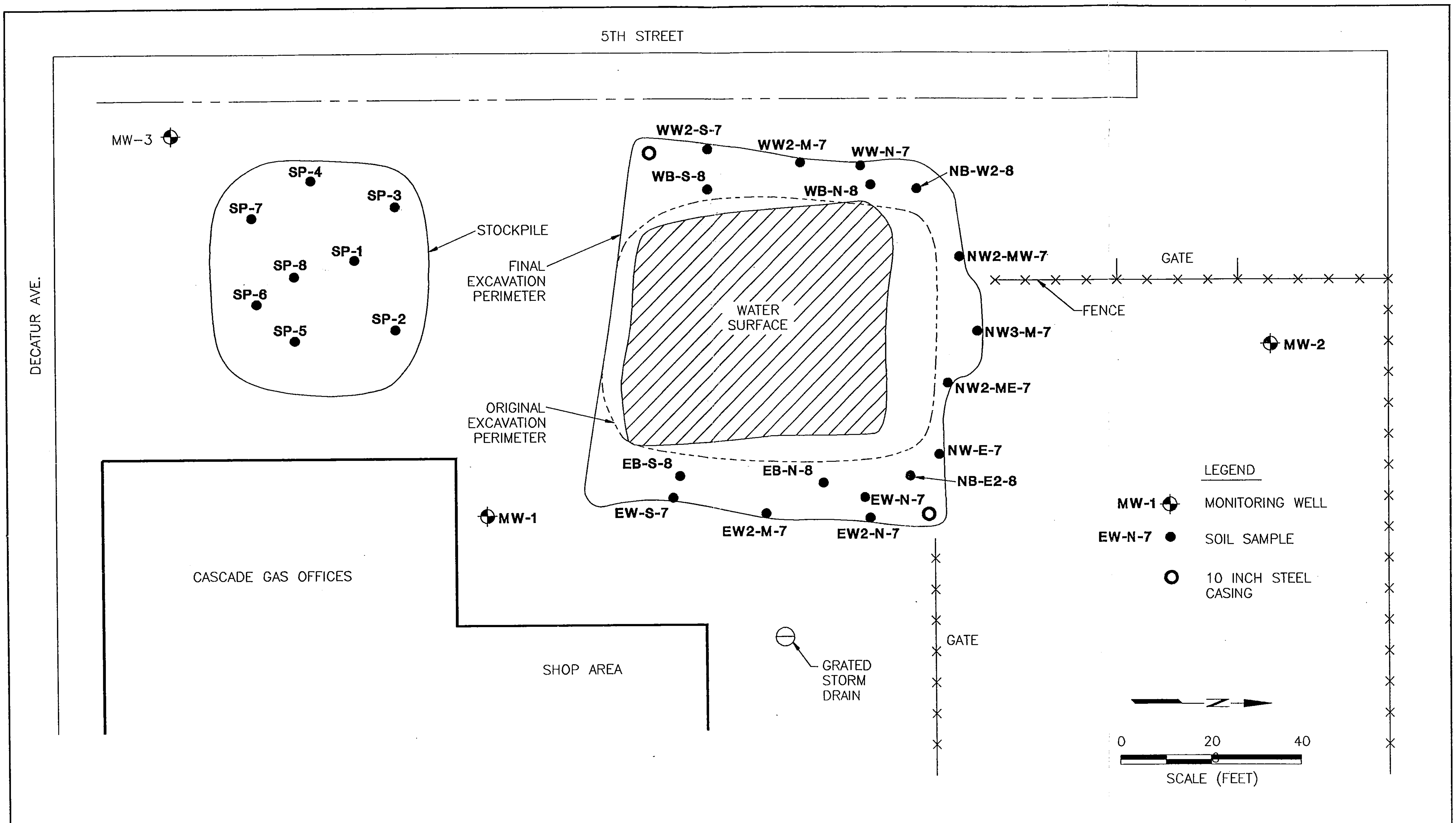
Environmental Engineering

DWN	L.Y.
APPR	
DATE	9/29/94
JOB#	C0902
	00058-019-01

FIGURE 4
WATER SUPPLY WELLS
CASCADE NATURAL GAS
512 EAST DECATUR AVENUE
SUNNYSIDE, WASHINGTON

DWG:CNG1914A



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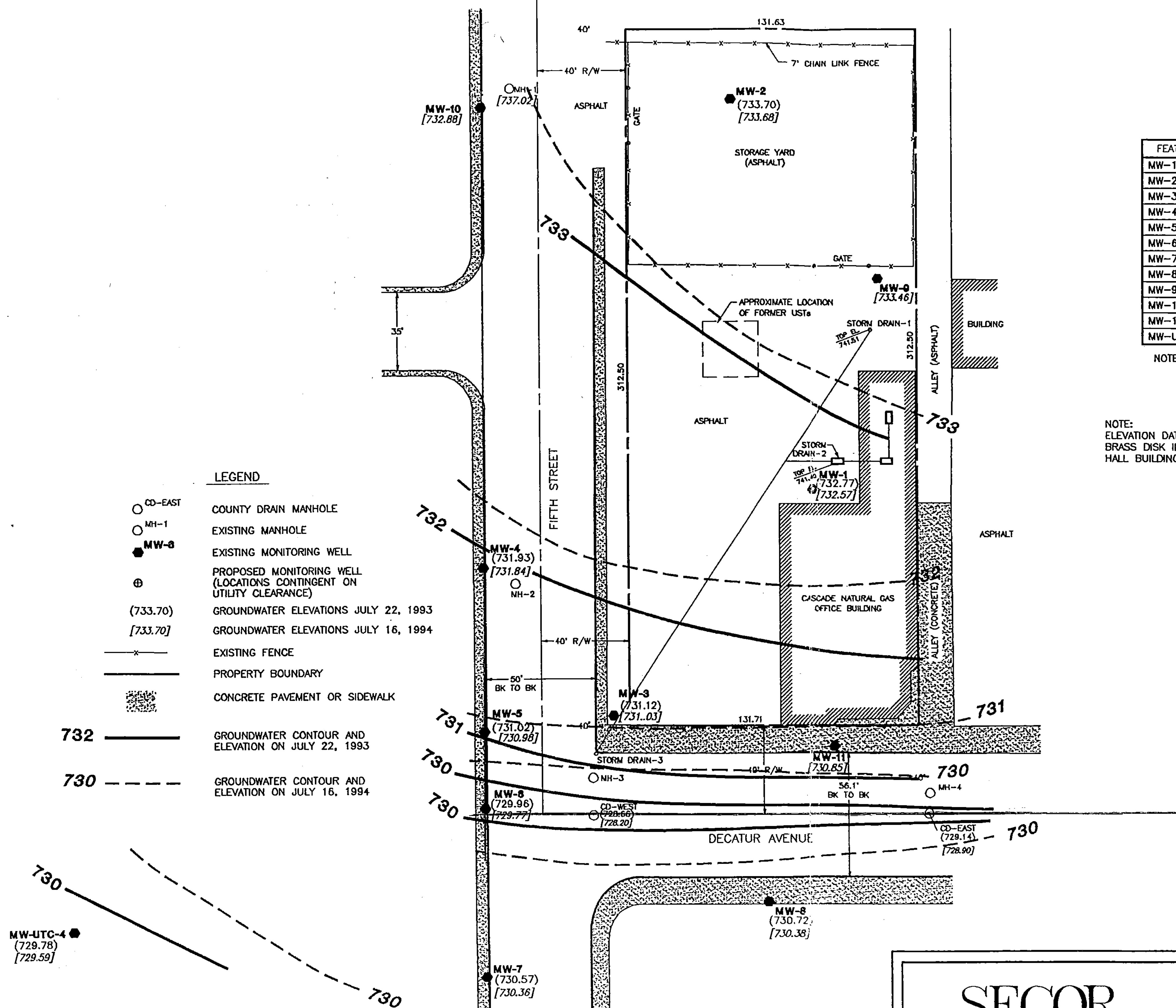
Environmental Engineering

DWN L.Y.
APPR
DATE 9/28/94
JOB# 00902
00058-019-01

FIGURE 6
OVER EXCAVATION SAMPLE LOCATIONS
CASCADE NATURAL GAS
512 EAST DECATUR AVENUE
SUNNYSIDE, WASHINGTON

DWG:CNG1908B



REFERENCE: PLSA ENGINEERING-SURVEYING-PLANNING YAKIMA, WASHINGTON (509) 575-6990 & CASCADE NATURAL GAS CORPORATION

REFERENCE ELEVATIONS

FEATURE	ELEVATION	FEATURE	ELEVATION
MW-1	741.77	MH-1	741.55
MW-2	742.40	MH-2	741.29
MW-3	740.99	MH-3	741.16
MW-4	740.78	MH-4	742.05
MW-5	740.61	CD-WEST	741.46
MW-6	740.70	CD-EAST	742.22
MW-7	740.59	STORM DRAIN-1	741.51
MW-8	741.00	STORM DRAIN-2	741.48
MW-9	742.37	STORM DRAIN-3	740.48
MW-10	741.32		
MW-11	741.47		
MW-UTC-4	740.19		

NOTE: WELL ELEVATIONS ARE TO TOP OF PVC CASING

NOTE:
ELEVATION DATUM ESTABLISHED FROM U.S.C. & G.S. BRASS DISK IN THE NORTHEAST CORNER OF CITY HALL BUILDING HAVING AN ELEVATION OF 742.77

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00058-019-01

FIGURE 7
GROUNDWATER CONTOUR MAP
CASCADE NATURAL GAS
512 DECATUR AVENUE
SUNNYSIDE, WASHINGTON

CNG1907B

TABLE 1
UST EXCAVATION
SEPTEMBER AND OCTOBER 1990
SUMMARY OF ANALYTICAL RESULTS
CASCADE NATURAL GAS CORPORATION
512 EAST DECATUR AVENUE, SUNNYSIDE, WASHINGTON

Sample Identification	Medium	TPH-G[A] mg/kg-mg/L[J]	TPH-D[B] mg/kg-mg/L	TPH-D1[C] mg/kg-mg/L	TPH-D2[D] mg/kg-mg/L	TPH-O[E] mg/kg-mg/L	Benzene[F] mg/kg-mg/L	Toluene[F] mg/kg-mg/l	Ethyl Benzene[F] mg/kg-mg/L	Xylenes[F] mg/kg-mg/L	1,2-Dichloroethane[G] mg/kg-mg/L	Pentachlorophenol[H] mg/kg-mg/L	Naphthalene[H] mg/kg-mg/L	2-Methylnaphthalene[H] mg/kg-mg/L	Dibenzofuran[H] mg/kg-mg/L	Butylbenzyl phthalate[H] mg/kg-mg/L	Total Lead[I] mg/kg-mg/L
CNG #1	Soil	NA[K]	NA	NA	NA	20,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CNG #2	Soil	NA	41.0	NA	NA	NA	Not Available	1.1	0.3	0.0	NA	NA	NA	NA	NA	NA	NA
CNG #3	Soil	NA	NA	NA	NA	3,700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CNG #4	Soil	1,230	160	NA	NA	NA	Not Available	Not Available	9	Not Available	NA	NA	NA	NA	NA	NA	NA
CNG #5	Soil	NA	NA	NA	NA	700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.65
CNG #6	Soil	NA	NA	NA	NA	3,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CNG #7	Soil	NA	NA	NA	NA	53,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CNG #8	Soil	1,700	NA	NA	NA	NA	6	11	20	3.5	NA	NA	NA	NA	NA	NA	NA
CNG51B	Soil	<10[L]	239	NA	NA	NA	<0.1	<0.1	<0.1	<0.1	NA	0.073	0.166	0.069	0.079	0.098	NA
CNG5	Soil	290	3,132	NA	NA	NA	0.9	0.6	12	Not Available	NA	NA	NA	NA	NA	NA	NA
CNGSUN A-1	Soil	95.2	326	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:

Data Source: White Shield, November 1990. Only detected analytes are reported.
A TPH-G = Total Petroleum Hydrocarbons in the gasoline range using EPA Method 8015 Modified.
B TPH-D = Total Petroleum Hydrocarbons in the diesel range using EPA Method 8015 Modified.
C TPH-D1 = Total Petroleum Hydrocarbons in the diesel #1 range using EPA Method 8015 Modified.
D TPH-D2 = Total Petroleum Hydrocarbons in the diesel #2 range using EPA Method 8015 Modified.
E TPH-O = Total Petroleum Hydrocarbons in the oil range using EPA Method 418.1.
F Volatile Organic Compounds using EPA Method 601/8010.
G Volatile Organic Compounds using EPA Method 8240.
H Semi-Volatile Organic Compounds using EPA Method 8270.
I Total Lead using EPA Method 7421.
J mg/kg for soil, mg/L for water
K NA = Not Analyzed
L < = Not detected at indicated limit of detection.

TABLE 1 (Con't)
UST EXCAVATION
SEPTEMBER AND OCTOBER 1990
SUMMARY OF ANALYTICAL RESULTS
CASCADE NATURAL GAS CORPORATION
512 EAST DECATUR AVENUE, SUNNYSIDE, WASHINGTON

Sample Identification	Medium	TPH-G[A] mg/kg-mg/L[J]	TPH-D[B] mg/kg-mg/L	TPH-D1[C] mg/kg-mg/L	TPH-D2[D] mg/kg-mg/L	TPH-O[E] mg/kg-mg/L	Benzene[F] mg/kg-mg/L	Toluene[F] mg/kg-mg/l	Ethyl Benzene[F] mg/kg-mg/L	Xylenes[F] mg/kg-mg/L	1,2-Dichloroethane[G] mg/kg-mg/L	Pentachlorophenol[H] mg/kg-mg/L	Naphthalene[H] mg/kg-mg/L	2-Methylnaphthalene[H] mg/kg-mg/L	Dibenzofuran[H] mg/kg-mg/L	Butylbenzyl phthalate[H] mg/kg-mg/L	Total Lead[I] mg/kg-mg/L
CNGSUN B-1	Soil	NA	NA	NA	NA	1,900	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CNGSUN A-2	Soil	186	550	NA	NA	NA	<10	<10	<10	<10	<10	NA	NA	NA	NA	NA	NA
CNGSUN B-2	Soil	NA	NA	NA	NA	2,100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CNGSUN A-3	Soil	540	2,609	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CNGSUN B-3	Soil	NA	NA	NA	NA	1,400	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CNGSUN A-4	Soil	16	105	NA	NA	<10	<10	<10	<10	<10	<10	NA	NA	NA	NA	NA	NA
CNGSUN B-4	Soil	NA	NA	NA	NA	930	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CNGSUN A-5	Soil	255	915	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CNGSUN B-5	Soil	NA	NA	NA	NA	3,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-9	Soil	NA	NA	NA	NA	22	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA
EPJ0890-10	Soil	<1	<25	NA	NA	<2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-12	Soil	200	NA	<25	120	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:

Data Source: White Shield, November 1990. Only detected analytes are reported.
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B TPH-D = Total Petroleum Hydrocarbons in the diesel range using EPA Method 8015 Modified.
C TPH-D1 = Total Petroleum Hydrocarbons in the diesel #1 range using EPA Method 8015 Modified.
D TPH-D2 = Total Petroleum Hydrocarbons in the diesel #2 range using EPA Method 8015 Modified.
E TPH-O = Total Petroleum Hydrocarbons in the oil range using EPA Method 418.1.
F Volatile Organic Compounds using EPA Method 601/8010.
G Volatile Organic Compounds using EPA Method 8240.
H Semi-Volatile Organic Compounds using EPA Method 8270.
I Total Lead using EPA Method 7421.
J mg/kg for soil, mg/L for water
K NA = Not Analyzed
L < = Not detected at indicated limit of detection.

TABLE 1 (Con't)
UST EXCAVATION
SEPTEMBER AND OCTOBER 1990
SUMMARY OF ANALYTICAL RESULTS
CASCADE NATURAL GAS CORPORATION
512 EAST DECATUR AVENUE, SUNNYSIDE, WASHINGTON

Sample Identification	Medium	TPH-G[A] mg/kg-mg/L[J]	TPH-D[B] mg/kg-mg/L	TPH-D1[C] mg/kg-mg/L	TPH-D2[D] mg/kg-mg/L	TPH-O[E] mg/kg-mg/L	Benzene[F] mg/kg-mg/L	Toluene[F] mg/kg-mg/l	Ethyl Benzene[F] mg/kg-mg/L	Xylenes[F] mg/kg-mg/L	1,2-Dichloroethane[G] mg/kg-mg/L	Pentachlorophenol[H] mg/kg-mg/L	Naphthalene[H] mg/kg-mg/L	2-Methylnaphthalene[H] mg/kg-mg/L	Dibenzofuran[H] mg/kg-mg/L	Butylbenzyl phthalate[H] mg/kg-mg/L	Total Lead[I] mg/kg-mg/L
EPJ0890-13	Water	<0.2	<5	NA	NA	15	NA	NA	NA	NA	0.054	NA	NA	NA	NA	NA	NA
EPJ0890-14	Soil	41	NA	<25	210	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-15	Soil	<1	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-17	Soil	390	<25	NA	NA	NA	NA	NA	NA	NA	0.016	NA	NA	NA	NA	NA	NA
EPJ0890-18	Soil	<1	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-20	Soil	2,600	NA	370	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-21	Soil	<1	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-23	Soil	260	NA	<25	3,100	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA
EPJ0890-24	Soil	<1	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-25	Soil	NA	NA	NA	NA	<10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-26	Soil	<1	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-27	Soil	46	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:

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C TPH-D1 = Total Petroleum Hydrocarbons in the diesel #1 range using EPA Method 8015 Modified.
D TPH-D2 = Total Petroleum Hydrocarbons in the diesel #2 range using EPA Method 8015 Modified.
E TPH-O = Total Petroleum Hydrocarbons in the oil range using EPA Method 418.1.
F Volatile Organic Compounds using EPA Method 601/8010.
G Volatile Organic Compounds using EPA Method 8240.
H Semi-Volatile Organic Compounds using EPA Method 8270.
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TABLE 1 (Con't)
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SEPTEMBER AND OCTOBER 1990
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CASCADE NATURAL GAS CORPORATION
512 EAST DECATUR AVENUE, SUNNYSIDE, WASHINGTON

Sample Identification	Medium	TPH-G[A] mg/kg-mg/L[J]	TPH-D[B] mg/kg-mg/L	TPH-D1[C] mg/kg-mg/L	TPH-D2[D] mg/kg-mg/L	TPH-O[E] mg/kg-mg/L	Benzene[F] mg/kg-mg/L	Toluene[F] mg/kg-mg/l	Ethyl Benzene[F] mg/kg-mg/L	Xylenes[F] mg/kg-mg/L	1,2-Dichloroethane[G] mg/kg-mg/L	Pentachlorophenol[H] mg/kg-mg/L	Naphthalene[H] mg/kg-mg/L	2-Methylnaphthalene[H] mg/kg-mg/L	Dibenzofuran[H] mg/kg-mg/L	Butylbenzyl phthalate[H] mg/kg-mg/L	Total Lead[I] mg/kg-mg/L
EPJ0890-28	Soil	220	<250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-29	Soil	NA	NA	NA	NA	<10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-30	Soil	260	NA	<250	1,360	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-31	Soil	120	NA	200	340	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-32	Soil	NA	NA	NA	NA	<10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-33	Soil	NA	NA	NA	NA	<10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-34	Soil	<1	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-35	Soil	<1	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-36	Soil	<1	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-37	Soil	<1	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-38	Soil	<1	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-39	Soil	<10	NA	380	1,200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:

Data Source: White Shield, November 1990. Only detected analytes are reported.
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C TPH-D1 = Total Petroleum Hydrocarbons in the diesel #1 range using EPA Method 8015 Modified.
D TPH-D2 = Total Petroleum Hydrocarbons in the diesel #2 range using EPA Method 8015 Modified.
E TPH-O = Total Petroleum Hydrocarbons in the oil range using EPA Method 418.1.
F Volatile Organic Compounds using EPA Method 601/8010.
G Volatile Organic Compounds using EPA Method 8240.
H Semi-Volatile Organic Compounds using EPA Method 8270.
I Total Lead using EPA Method 7421.
J mg/kg for soil, mg/L for water
K NA = Not Analyzed
L < = Not detected at indicated limit of detection.

TABLE 1 (Con't)
UST EXCAVATION
SEPTEMBER AND OCTOBER 1990
SUMMARY OF ANALYTICAL RESULTS
CASCADE NATURAL GAS CORPORATION
512 EAST DECATUR AVENUE, SUNNYSIDE, WASHINGTON

Sample Identification	Medium	TPH-G[A] mg/kg-mg/L[J]	TPH-D[B] mg/kg-mg/L	TPH-D1[C] mg/kg-mg/L	TPH-D2[D] mg/kg-mg/L	TPH-O[E] mg/kg-mg/L	Benzene[F] mg/kg-mg/L	Toluene[F] mg/kg-mg/l	Ethyl Benzene[F] mg/kg-mg/L	Xylenes[F] mg/kg-mg/L	1,2-Dichloroethane[G] mg/kg-mg/L	Pentachlorophenol[H] mg/kg-mg/L	Naphthalene[H] mg/kg-mg/L	2-Methylnaphthalene[H] mg/kg-mg/L	Dibenzofuran[H] mg/kg-mg/L	Butylbenzyl phthalate[H] mg/kg-mg/L	Total Lead[I] mg/kg-mg/L
EPJ0890-40	Soil	<1	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-41	Soil	84	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-42	Soil	<1	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-43	Soil	NA	NA	NA	NA	<20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-44	Soil	NA	NA	NA	NA	<20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-45	Soil	NA	NA	NA	NA	<20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-46	Soil	NA	NA	NA	NA	<20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EPJ0890-11	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.003	NA	NA	NA	NA	NA	NA
EPJ0890-16	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA
EPJ0890-19	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA
EPJ0890-22	Soil	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA

NOTES:

Data Source: White Shield, November 1990. Only detected analytes are reported.
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B TPH-D = Total Petroleum Hydrocarbons in the diesel range using EPA Method 8015 Modified.
C TPH-D1 = Total Petroleum Hydrocarbons in the diesel #1 range using EPA Method 8015 Modified.
D TPH-D2 = Total Petroleum Hydrocarbons in the diesel #2 range using EPA Method 8015 Modified.
E TPH-O = Total Petroleum Hydrocarbons in the oil range using EPA Method 418.1.
F Volatile Organic Compounds using EPA Method 601/8010.
G Volatile Organic Compounds using EPA Method 8240.
H Semi-Volatile Organic Compounds using EPA Method 8270.
I Total Lead using EPA Method 7421.
J mg/kg for soil, mg/L for water
K NA = Not Analyzed
L < = Not detected at indicated limit of detection.

TABLE 2 (Con't)
APRIL 1991
ANALYTICAL SUMMARY
CASCADE NATURAL GAS CORPORATION
512 EAST DECATUR AVENUE, SUNNYSIDE, WASHINGTON

SOIL CHEMICAL ANALYSIS SUMMARY

Sample Identification	Sample Date	Benzene µg/kg	Toluene µg/kg	Ethyl Benzene µg/kg	Xylenes µg/kg	Naphthalene µg/kg	2-Methyl-Naphthalene µg/kg	Bis(2-Ethylhexyl) Phthalate µg/kg	Butylbenzyl-Phthalate µg/kg
MW #1 (13'-15')	4/11/91	1,400^{E}	560	2,300^{E}	7,400^{E}	160^{J}	150^{J}	760^{J}	---
MW #1 Duplicate (13'-15')	4/11/91	---	---	---	---	260^{J}	340^{J}	500^{J}	140^{J}
MW #1 (18'-20')	4/11/91	---	---	---	---	---	---	210^{J}	210^{J}
MW #2 (8'-10')	4/11/91	---	---	---	---	---	---	220^{J}	120^{J}
MS #2 (18'-20')	4/11/91	---	---	---	---	---	---	670^{J}	85^{J}
MS #3 (13'-15')	4/11/91	---	44	10	140	---	---	1,100^{J}	220^{J}
MW #3 (18'-20')	4/11/91	---	---	---	---	---	---	600^{J}	90^{J}

NOTES:

Data Source: DRPA and SAIC, May 1991

--- = Analyzed but not detected.
NA = Not analyzed.
µg/kg = Micrograms per kilogram - equivalent to parts per billion (ppb).
mg/kg = Milligrams per kilogram - equivalent to parts per million (ppm).
E = Compound exceeds instrument calibration range - estimated value.
J = Value is estimated because less method quantification reporting limit.

TABLE 2
APRIL 1991
ANALYTICAL SUMMARY
CASCADE NATURAL GAS CORPORATION
512 EAST DECATUR AVENUE, SUNNYSIDE, WASHINGTON

GROUNDWATER CHEMICAL ANALYSIS SUMMARY

Sample Identification	Sample Date	Benzene (µg/l)	Ethyl Benzene (µg/l)	Toluene (µg/l)	Xylenes (µg/l)	Methylene Chloride (µg/l)
CNG-01-001-W	4/17/91	51	---	---	---	---
CNG-02-001-W	4/17/91	---	---	---	---	---
CNG-03-001-W	4/17/91	---	---	---	---	---
Trip Blank	4/17/91	---	---	---	---	53

NOTES:

Data Source: DRPA and SAIC, May 1991

--- = Analyzed but not detected.
NA = Not analyzed.
µg/l = Micrograms per liter - equivalent to parts per billion (ppb).
mg/l = Milligrams per liter - equivalent to parts per million (ppm).

TABLE 2 (Con't)
APRIL 1991
ANALYTICAL SUMMARY
CASCADE NATURAL GAS CORPORATION
512 EAST DECATUR AVENUE, SUNNYSIDE, WASHINGTON

SOIL CHEMICAL ANALYSIS SUMMARY

Sample Identification	Sample Date	Di-n-Octyl Phthalate µg/kg	Diethylphthalate µg/kg	Di-n-butyl-phthalate µg/kg	Acetone µg/kg	Methylene Chloride µg/kg	1,1-Dichloroethane µg/kg	1,1,1-Trichloroethane µg/kg
MW #1 (13'-15')	4/11/91	---	---	---	13,000^{E}	---	---	---
MW #1 Duplicate (13'-15')	4/11/91	110^{J}	---	---	---	---	---	---
MW #1 (18'-20')	4/11/91	140^{J}	---	---	3,300^{E}	3,900^{E}	---	---
MW #2 (8'-10')	4/11/91	---	160^{J}	---	---	---	---	---
MS #2 (18'-20')	4/11/91	---	---	---	12,000^{E}	7,300^{E}	---	---
MS #3 (13'-15')	4/11/91	160^{J}	---	---	65	---	7	5
MW #3 (18'-20')	4/11/91	---	---	98^{J}	13	---	---	---

NOTES:

Data Source: DRPA and SAIC, May 1991

--- = Analyzed but not detected.
NA = Not analyzed.
µg/kg = Micrograms per kilogram - equivalent to parts per billion (ppb).
mg/kg = Milligrams per kilogram - equivalent to parts per million (ppm).
E = Compound exceeds instrument calibration range - estimated value.
J = Value is estimated because less method quantification reporting limit.

TABLE 3
JULY AND DECEMBER 1991
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CASCADE NATURAL GAS CORPORATION
512 EAST DECATUR AVENUE, SUNNYSIDE, WASHINGTON

Sample Identification	Date Sampled	TPH-D[1] μg/L	TPH-G[2] μg/L	Benzene[3] μg/L	Toluene[3] μg/L	Ethyl Benzene[3] μg/L	Xylenes[3] μg/L	Halogenated Volatile Organics[4] μg/L
MW-1	7/2/91	ND[5]	130	ND	ND	ND	ND	1,2-Dichloroethane = 110
	12/17/91	420[6]	790	3.6	2.4	14	11	1,2-Dichloroethane = 160
MW-2	7/2/91	ND	150	ND	ND	ND	ND	ND
	12/17/91	ND	ND	ND	ND	ND	ND	1,2-Dichloroethane = 1.4
MW-3	7/2/91	4,200	1,800,000	29,000	3,800	410	310	1,2-Dichloroethane = 460
	12/17/91	7,500[6]	18,000	3,300	290	410	260	1,2-Dichloroethane = 510 Methylene Chloride = 26
Rinse Blank	12/17/91	---[7]	ND	ND	ND	ND	ND	Chloroform = 13

NOTES:

1 Total Petroleum Hydrocarbons in the diesel range using EPA Method 8015 Modified.
2 Total Petroleum Hydrocarbons in the gasoline range using EPA Method 8015 Modified.
3 Volatile Organic Compounds using EPA Method 8020.
4 Halogenated Volatile Organic Compounds using EPA Method 8010. Only detected compounds are shown.
5 Not detected above laboratory limit of detection, see laboratory data sheets for reported limit of detection.
6 The hydrocarbons present in this sample are primarily due to purgeable gasoline compounds, see laboratory report footnotes attached.
7 --- = Not analyzed.

T. .E 4

JANUARY 1992

EXCAVATION MONITORING
SUMMARY OF SOIL ANALYTICAL RESULTS
CASCADE NATURAL GAS CORPORATION
512 EAST DECATUR AVENUE, SUNNYSIDE, WASHINGTON
(Results on a wet weight basis)

Sample Identification[1]	Approximate Depth (feet)	WTPH-D[2] mg/kg	WTPH-G[3] mg/kg	Benzene[4] mg/kg	Toluene[4] mg/kg	Ethyl Benzene[4] mg/kg	Xylenes[4] mg/kg	VOCs[5]	Semi-Volatiles[6]
WN-W-7	7	ND[7]	ND	ND	ND	ND	ND	---[8]	---
NW-E-7	7	ND	ND	ND	ND	ND	ND	---	---
EW-N-7	7	11,000	6,700	ND	12	23	240	---	Notes[6]
EW-S-7	7	130	ND	ND	ND	ND	ND	---	---
EW2-N-7	7	ND	ND	ND	ND	ND	ND	---	---
EW2-M-7	7	ND	ND	ND	ND	ND	ND	---	---
NW3-M-7	7	17	ND	ND	ND	ND	ND	---	---
NW2-MW-7	7	ND	ND	ND	ND	ND	ND	---	---
NW2-ME-7	7	ND	ND	ND	ND	ND	ND	---	---
WW2-M-7	7	ND	ND	ND	ND	ND	ND	---	---
WW2-S-7	7	ND	ND	ND	ND	ND	ND	---	---
EB-S-8	8	2,900	4,000	3.3	ND	23	64	---	---
EB-N-8	8	370	1,400	ND	ND	3.4	13	---	---

NOTES:

1 WW = Westwall, EW = Eastwall, NW = Northwall, EB = East Bottom, WB = West Bottom, NB = North Bottom, N = North, E = East, S = South, M = Middle, SP = Stockpile.
2 Total Petroleum Hydrocarbons in the diesel range using EPA Method 8015 Modified.
3 Total Petroleum Hydrocarbons in the gasoline range using EPA Method 8015 Modified.
4 Volatile Organic Compounds using EPA Method 8020.
5 Volatile Organic Compounds using EPA Method 8240. See laboratory report for results.
6 Semi-Volatile Organics using EPA Method 8270. See laboratory report for results.
7 Not detected above laboratory method detection limits.
8 --- = Not analyzed.

TABL (Con't)
JANUARY 1992
EXCAVATION MONITORING
SUMMARY OF SOIL ANALYTICAL RESULTS
CASCADE NATURAL GAS CORPORATION
512 EAST DECATUR AVENUE, SUNNYSIDE, WASHINGTON
(Results on a wet weight basis)

Sample Identification[1]	Approximate Depth (feet)	WTPH-D[2] mg/kg	WTPH-G[3] mg/kg	Benzene[4] mg/kg	Toluene[4] mg/kg	Ethyl Benzene[4] mg/kg	Xylenes[4] mg/kg	VOCs[5]	Semi-Volatiles[6]
WB-N-8	8	80	130	ND	ND	ND	0.12	---	---
WB-S-8	8	340	420	0.97	ND	2.1	2.4	---	---
NB-E2-8	8	1,700	1,400	0.57	ND	2.7	3.1	---	---
NB-W2-8	8	1,100	8,500	9.8	ND	44	73	---	---
SP-1	Stockpile	82	590	ND	ND	1.1	9.2	---	---
SP-2	Stockpile	650	36	ND	ND	ND	ND	Notes[5]	Notes[6]
SP-3	Stockpile	24	2.4	ND	ND	ND	ND	---	---
SP-4	Stockpile	48	21	ND	ND	ND	ND	---	---
SP-5	Stockpile	150	28	ND	ND	ND	ND	---	---
SP-6	Stockpile	110	100	ND	ND	0.20	1.6	---	---
SP-7	Stockpile	75	65	ND	ND	ND	0.28	---	---
SP-8	Stockpile	370	610	ND	ND	2.2	3.8	Notes[5]	Notes[6]

NOTES:

1 WW = Westwall, EW = Eastwall, NW = Northwall, EB = East Bottom, WB = West Bottom, NB = North Bottom, N = North, E = East, S = South, M = Middle, SP = Stockpile.
2 Total Petroleum Hydrocarbons in the diesel range using EPA Method 8015 Modified.
3 Total Petroleum Hydrocarbons in the gasoline range using EPA Method 8015 Modified.
4 Volatile Organic Compounds using EPA Method 8020.
5 Volatile Organic Compounds using EPA Method 8240. See laboratory report for results.
6 Semi-Volatile Organics using EPA Method 8270. See laboratory report for results.
7 Not detected above laboratory method detection limits.
8 --- = Not analyzed.

TABLE 6
REMEDIAL INVESTIGATION
SUMMARY OF WATER ANALYSES
CASCADE NATURAL GAS CORPORATION
512 EAST DECATUR AVENUE, SUNNYSIDE WASHINGTON

Sample Identification	Sample Date	TPH-G (A) ug/L	TPH-D (B) ug/L	Acetone (C) ug/L	1,2-Dichloroethane (C) ug/L	Benzene (C) ug/L	Ethylbenzene (c) ug/L	Toluene (C) ug/L	Xylenes (C) ug/L	2 Methylnaphthalene (D) ug/L	Naphthalene (D) ug/L
MW-1	7/21/93	330	300	Not analyzed	Not analyzed	3.2	1	9	4	Not analyzed	Not analyzed
MW-1	7/16/94	Not analyzed	Not analyzed	<400 (F)	120	<1.0	<20	<20	<10	<10	<16
MW-12 (E)	7/16/94	Not analyzed	Not analyzed	<400	120	<1.0	<20	<20	<10	<10	<16
MW-2	7/21/93	<50	<250	Not analyzed	Not analyzed	<0.50	<0.50	<0.50	<0.50	Not analyzed	Not analyzed
MW-2	7/16/94	Not analyzed	Not analyzed	<400	<2.0	<1.0	<20	<20	<10	<10	<16
MW-3	7/21/93	5200	7900(D-1)	Not analyzed	Not analyzed	2900	260	240	280	Not analyzed	Not analyzed
MW-3	7/16/94	Not analyzed	Not analyzed	<80000	460	2600	<4000	<4000	<2000	27	120
MW-3	8/5/94	Not analyzed	Not analyzed	51	400	2300	330	220	220	Not analyzed	Not analyzed
MW-4	7/21/93	4100	1200(D-1)	Not analyzed	Not analyzed	120	7.6	95	65	Not analyzed	Not analyzed
MW-4	7/16/94	Not analyzed	Not analyzed	<400	27	110	59	<20	42	<10	<16
MW-5	7/21/93	5700	1100(D-1)	Not analyzed	Not analyzed	78	26	180	240	Not analyzed	Not analyzed
MW-6	7/21/93	<50	<250	Not analyzed	Not analyzed	<0.50	<0.50	<0.50	<1.0	Not analyzed	Not analyzed
MW-7	7/21/93	<50	<250	Not analyzed	Not analyzed	<0.50	<0.50	<0.50	<1.0	Not analyzed	Not analyzed
MW-8	7/21/93	<50	<250	Not analyzed	Not analyzed	<0.50	<0.50	<0.50	<1.0	Not analyzed	Not analyzed
MW-9	7/16/94	75	5100 (D-1)	<400	10	<1.0	<20	<20	<10	<10	<16
MW-10	7/16/94	<50	<250	<400	3.2	<1.0	<20	<20	<10	<10	<16
MW-11	7/16/94	<50	<250	<400	11	<1.0	<20	<20	<10	<10	<16
MH-1	7/16/94	<50	360	<400	<2.0	<1.0	<20	<20	<10	<10	<16
CD-WEST	7/21/93	<50	<250	Not analyzed	Not analyzed	2.7	<0.50	1.2	<1.0	Not analyzed	Not analyzed
CD-WEST	8/5/94	Not analyzed	Not analyzed	<400	<2.0	30	18	<20	<5.0	Not analyzed	Not analyzed
CD-EAST	7/21/93	<50	<250	Not analyzed	Not analyzed	<0.50	<0.50	0.73	<0.50	Not analyzed	Not analyzed
CD-EAST	8/5/94	Not analyzed	Not analyzed	<400	<2.0	<2.0	<5.0	<20	<5.0	Not analyzed	Not analyzed
RinsateBlank	7/22/93	<50	<250	Not analyzed	Not analyzed	<0.50	<0.50	<0.50	<1.0	Not analyzed	Not analyzed
Blank(method)	7/21-22/93 batch	<50	<250	Not analyzed	Not analyzed	<0.50	<0.50	<0.50	<1.0	Not analyzed	Not analyzed
Blank(trip)	7/21-22/93 batch	Not analyzed	Not analyzed	Not analyzed	Not analyzed	<0.50	<0.50	<0.50	<1.0	Not analyzed	Not analyzed
Blank(trip)	7/16/94 batch	Not analyzed	Not analyzed	<400	<2.0	<1.0	<20	<20	<10	<10	<16
Blank(trip)	8/5/94 batch	Not analyzed	Not analyzed	<400	<2.0	<2.0	<5.0	<5.0	<5.0	Not analyzed	Not analyzed

All analyses by North Creek Analytical of Bothell, Washington.
Only those analytes that were detected at or above the reporting limits are shown. See the laboratory report for full analyte suite.
A. Total petroleum hydrocarbons in the gasoline range using Washington State Method WTPH-G.
B. Total petroleum hydrocarbons in the diesel range using Washington State Method WTPH-D.
C. Volatile organic compounds using EPA Method 8240 for 1994 samples and EPA Method 8020 for 1993 samples.
D. Semi-volatile organic compounds using EPA Method 8270.
E. Sample MW-12 is a blind field duplicate of sample MW-1.
F. Values identified with "<" are not detected at the indicated reporting limit.

TABLE 5
REMEDIAL INVESTIGATION
SUMMARY OF SOIL ANALYSES
CASCADE NATURAL GAS CORPORATION
512 EAST DECATUR AVENUE, SUNNYSIDE WASHINGTON

Sample Identification	Sample Depth (feet)	Sample Date	TPH-G (A) mg/Kg	TPH-D (B) mg/Kg	Volatile organic compounds (C) mg/Kg	Pentachlorophenol (D) mg/Kg	Benzene (E) mg/Kg	Toluene (E) mg/Kg	Ethyl benzene (E) mg/Kg	Xylenes (E) mg/Kg
MW-4	9.5-10.0	7/20/93	3.7	<10 (f)	Not Analyzed	Not Analyzed	0.54	<0.050	0.079	<1.0
MW-5	13.5-14.0	7/20/93	78	<10	Not Analyzed	Not Analyzed	<0.050	<0.050	0.12	<1.0
MW-6	9.0-9.5	7/20/93	<1.0	<10	Not Analyzed	Not Analyzed	<0.050	<0.050	<0.050	<1.0
MW-7	10.0-10.5	7/20/93	<1.0	<10	Not Analyzed	Not Analyzed	<0.050	<0.050	<0.050	<1.0
MW-8	9.0-9.5	7/20/93	<1.0	<10	Not Analyzed	Not Analyzed	<0.050	<0.050	<0.050	<1.0
MW-9-4.5	4.5-5	7/15/94	<50	<100	None detected	5.2	<0.25	<20	<10	<10
MW-9-10.5-11.0	10.5-11	7/15/94	<50	<100	None detected	<4.0	<0.25	<20	<10	<10
MW-10-4.5-5.0	4.5-5	7/15/94	<50	<100	None detected	<4.0	<0.25	<20	<10	<10
MW-10-9.5-10	10-10.5	7/15/94	<50	<100	None detected	<4.0	<0.25	<20	<10	<10
MW-11-5.0-5.5	4.5-5	7/15/94	<50	<100	None detected	<4.0	<0.25	<20	<10	<10
MW-11-10.5-11.	10-10.5	7/15/94	<50	<100	None detected	<4.0	<0.25	<20	<10	<10
						<0.25	<20	<10	<10	
BLANK	-	-	<50	<100	None detected	<4.0	<0.25	<20	<10	<10

Notes:
All analyses by North Creek Analytical of Bothell, Washington.
Only those analytes that were detected at or above the reporting limits are shown. See the laboratory report for full analyte suite.
A. Total petroleum hydrocarbons in the gasoline range using Washington State Method WTPH-G.
B. Total petroleum hydrocarbons in the diesel range using Washington State Method WTPH-D.
C. Volatile organic compounds using EPA Method 8240. Variable detection limits as shown on the laboratory reports.
D. Semi-volatile organic compounds using EPA Method 8270.
E. Benzene, toluene, ethyl benzene and xylenes using EPA Method 8240 for 1994 samples and EPA Method 8020 for 1993 samples.
F. Values indentified with "<" are not detected at the indicated reporting limit.

TABLE 7
REMEDIAL INVESTIGATION
SUMMARY OF WATER LEVEL DATA
CASCADE NATURAL GAS CORPORATION
512 EAST DECATUR AVENUE, SUNNYSIDE WASHINGTON

Well Number	Date	Reference Elevation (a) (feet)	Depth to Water (feet)	Water Elevation (feet)	Comments
MW-1	7/21/93	741.77	8.97	732.80	
	7/22/93	741.77	9.00	732.77	
	7/16/94	741.77	9.20	732.57	
MW-2	7/21/93	742.40	8.65	733.75	
	7/22/93	742.40	8.70	733.70	
	7/16/94	742.40	8.72	733.68	
MW-3	7/21/93	740.99	9.84	731.15	Odor and sheen
	7/22/93	740.99	9.87	731.12	Odor and sheen
	7/16/94	740.99	9.96	731.03	
MW-4	7/21/93	740.78	8.84	731.94	Odor and sheen
	7/22/93	740.78	8.85	731.93	Odor and sheen
	7/16/94	740.78	8.94	731.84	
MW-5	7/21/93	740.61	9.56	731.05	Odor and sheen
	7/22/93	740.61	9.59	731.02	Odor and sheen
	7/16/94	740.61	9.63	730.98	
MW-6	7/21/93	740.70	10.73	729.97	
	7/22/93	740.70	10.74	729.96	
	7/16/94	740.70	10.93	729.77	
MW-7	7/21/93	740.59	9.98	730.61	
	7/22/93	740.59	10.02	730.57	
	7/16/94	740.59	10.23	730.36	
MW-8	7/21/93	741.19	10.42	730.77	
	7/22/93	741.19	10.47	730.72	
	7/16/94	741.19	10.62	730.57	
MW-9	7/16/94	742.37	8.91	733.46	
MW-10	7/16/94	741.32	8.44	732.88	
MW-11	7/16/94	741.47	10.62	730.85	
CD-East	7/21/93	742.22	13.32	728.90	
	7/22/93	742.22	13.08	729.14	
CD- West	7/21/93	741.46	12.81	728.65	
	7/22/93	741.46	12.80	728.66	Sheen
UTC-4	7/21/93	740.19	10.38	729.81	
	7/22/93	740.19	10.41	729.78	
	7/16/94	740.19	10.60	729.59	

(a) Elevations are referenced to top of casing and were surveyed to USGS datum by PLSA Engineering & Surveying of Yakima, Washington. Except for wells MW-9, MW-10 and MW-11, which were surveyed by SECOR relative to PLSA benchmarks.

APPENDIX A
AGREED ORDER AND
WORK PLAN ATTACHMENTS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
106 South 6th Ave. • Yakima, Washington 98902-3387 • (509) 575-2490

APR 06 1994

CERTIFIED MAIL
P 371 103 073

Mr. Ralph E. Boyd
Vice President
Cascade Natural Gas Corporation
222 Fairview Avenue North
Seattle, WA 98109

Dear Mr. Boyd:

RE: Agreed Order for Cascade Natural Gas, Sunnyside, Washington

Please find enclosed two copies of the Agreed Order No. DE 94TC-C165 for conducting a Remedial Investigation/Feasibility Study at the Sunnyside, Washington, Cascade Natural Gas Facility. Please sign the signature pages and return them to me at our Yakima office, at the above address. Once you have signed the Orders, Tony Grover, the Section Manager, will sign and date stamp. The CNG copy will then be returned.

We will expect to receive the signed Agreed Order no later than April 15, 1994.

Thank you for your cooperation in this matter. If you have any question concerning this matter, please feel free to contact me at (509) 454-7834.

Sincerely,

Donald W. Abbott
Site Manager
Toxics Cleanup Program

DWA:vw
g:\cvrltr.cng

Enclosures

cc: Jerry Ackerman, AAG, Lacey
Jim Chulos, TCP-CRO
Thomas Lindley, Attorney
Miller, Nash, Wiener, Hager & Carlsen

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action by:	)	
	)	
CASCADE NATURAL GAS CORPORATION	)	AGREED ORDER
	)	
	)	No. DE 94TC-C165
	)	

TO: Ralph E. Boyd
Cascade Natural Gas Corporation
222 Fairview Avenue North
Seattle, Washington 98109

I.

Jurisdiction

This Agreed Order ("Order") is issued pursuant to the authority of Revised Code of Washington (RCW) 70.105D.050(1).

II.

Findings of Fact

The Department of Ecology (Ecology) makes the following Findings of Fact, without admission of such facts by Cascade Natural Gas Corporation (CNG).

2.1. CNG presently owns property located on 512 East Decatur Avenue, Sunnyside, Washington ("Site"); it leased that property from 1969 to 1979, and has owned it since 1979. The County of Yakima ("County") is one of the former owners of the Site, and the County owned the property, from at least 1928 through 1955, operating it as a public works shop and equipment yard.

2.2. Beginning at least by 1936, two to four underground storage tanks ("USTs") were located on this Site. The County originally installed and operated at least two, and perhaps three, of these USTs, one for gasoline and one or two for diesel fuel; the County's ownership and operation of these USTs continued until 1956. When it vacated the Site, the County left all of its USTs buried at the Site. It is unclear whether one, two, or three USTs were still in operation when the County left the Site.

2.3. From 1956 to 1969 two automobile sales and service operations ("Dealers") occupied the Site. It is unclear as to which, if any, of the USTs were utilized by the Dealers. One or two of the USTs may have been used to store fuel to heat the on-site buildings from the mid-1950s until the mid-1960s, when the building was then converted to gas and electric heat. In 1960, a fourth UST, for gasoline, was installed near the three older USTs. By the mid-1960s, it is certain that all other USTs had ceased to be used, but all remained at the Site. In the mid-to-late 1960s the Site was wholly covered with asphalt, leaving only the dispenser for the newest gasoline UST visible. Each Dealer ultimately left the Site, and all apparently have ceased to exist.

2.4. In 1969 CNG began leasing the Site. In 1979 CNG purchased the Site. CNG staff have submitted statements that diesel fuel was never used at the Site. CNG did use the new gasoline UST from 1969 until 1988. In 1990, to comply with Washington's new UST regulations, CNG retained a contractor to excavate the one UST of which CNG was aware. At that point CNG discovered the remaining three other USTs, and also learned, for the first time, that both soil and groundwater beneath the Site contained gasoline, diesel, volatile, and semi-volatile organic compounds at levels above those that require remedial action under Washington's applicable regulations.

2.5. On February 12, 1991, CNG, as the Site's current owner, was notified that Ecology intended to conduct a site hazard assessment to determine whether further remedial efforts were required and to rank the Site under the Washington Ranking Method as a means of prioritizing the Site for cleanup. On August 16, 1991, Ecology notified CNG that Ecology had completed its assessment and ranking process, and that on a scale of 1 (highest priority) to 5 (lowest priority) had assigned the Site a #1 based on conditions then existing at the Site. Those conditions have since changed by virtue of CNG's actions.

2.6. CNG has voluntarily undertaken activities to investigate and remediate the contamination. CNG has removed and remediated soil contaminated by petroleum hydrocarbons at the Site and CNG has begun the investigation of potential diesel, gasoline, and volatile organic compounds contaminating the groundwater at the Site through the installation of monitoring wells and storm drain and sewer line monitoring.

2.7. Documentation of the presence of contaminated soil and groundwater in the vicinity of CNG, located at 512 East Decatur Avenue in Sunnyside, Washington, is contained in the following reports which are on file at the Department of Ecology's Central Regional Office:

a. Draft Interim Status Report, Cascade Natural Gas Corporation Sunnyside Operation, White Shield Inc., November 1990.

b. Draft Site Hazard Assessment (SHA) Report, Cascade Natural Gas Corporation, DPRA Inc. For Washington Department of Ecology, May 1991.

c. Soil Remediation Status Report, Cascade Natural Gas Facility, Sunnyside, Washington, SEACOR, February 1992.

2.8. The continued presence of contamination in soils and groundwater at the Site presents an ongoing threat to human health and the environment.

III.
Ecology Determinations

3.1. CNG is an "owner or operator" as defined in RCW 70.105D.020(6) of a "facility" as defined in RCW 70.105D.020(3).

3.2. The facility is known as the Cascade Natural Gas Facility and is located at 512 East Decatur Avenue, Sunnyside, Washington.

3.3. The substances found at the facility as described above are "hazardous substances" as defined in RCW 70.105D.020(5).

3.4. Based on the presence of these hazardous substances at the facility and all factors known to Ecology, there is a release or threatened release of hazardous substances from the facility, as defined in RCW 70.105D.020(10).

3.5. By letter dated March 6, 1992, due to CNG's status as current owner/operator of the Site, Ecology notified CNG of its status as a "potentially liable person" under RCW 70.105D.040 after notice and opportunity for comment.

3.6. Pursuant to RCW 70.105D.030(1) and 70.105D.050, Ecology may require potentially liable persons to investigate or conduct other remedial actions with respect to the release or threatened release of hazardous substances, whenever it believes such action to be in the public interest.

3.7. Based on the foregoing facts, Ecology believes the remedial action required by this Order is in the public interest. Ecology has determined that CNG must take remedial actions at the Site, as set forth below.

IV.

Work to be Performed

Based on the foregoing Facts and Determinations, it is hereby ordered that CNG take the following remedial actions and that these actions be conducted in accordance with Chapter 173-340 WAC unless otherwise specifically provided for herein.

4.1. CNG will perform those Remedial Investigation/ Feasibility Study ("RI/FS") actions, set forth and described in the attached Work Plan, Schedule, and Addendum (the "Work Plan"); those documents are attached to this Order as Exhibit A. Exhibit A is incorporated by this reference and is an integral and enforceable part of this Order.

a. The RI/FS will collect, develop, and evaluate sufficient information regarding the Site to enable the selection of any remaining cleanup actions. To collect sufficient information, the Work Plan's product will consist of general facility information, field investigations of surface water and sediments, soils, geology and groundwater system characteristics, air issues, if any, land use, natural resources and ecology, as well as work plans. The RI/FS will be implemented to meet the requirements of WAC 173-340-350 (State Remedial Investigation and Feasibility Study).

b. According to the attached Schedule of Work, CNG will develop and submit to Ecology for approval a Quality Assurance/Quality Control ("QA/QC") Plan in accordance with the Ecology Guidelines and Specifications for Preparing Quality Assurance Project Plans (May 1991). No sampling may be conducted prior to Ecology approval of the QA/QC Plan.

c. Ecology recognizes that considerable work has been completed toward characterizing the Site. Data collected from previous investigations should be incorporated into the RI/FS to prevent the duplication of any tasks required in the Work Plan.

4.2. Results from sampling shall be provided to Ecology's project coordinator upon receipt from the laboratory.

4.3. Written progress reports shall be submitted to Ecology on behalf of CNG on a timely basis during the RI phase of the investigation. If Ecology determines that the reports are not being submitted on a timely basis, Ecology will verbally notify the PLP's project coordinator. Thereafter, if the timeliness of subsequent reporting does not satisfy Ecology, Ecology may in writing direct a specific frequency for reporting.

4.4. CNG shall immediately notify Ecology by telephone of any unexpected delays in construction.

4.5. In accordance with WAC 173-340-840(5), ground water sampling data shall be submitted according to Exhibit B: SITE DESCRIPTION AND SAMPLE DATA SUBMITTAL REQUIREMENTS. These submittals shall be provided to Ecology as required under the schedule established in Exhibit A. Exhibit B is incorporated by this reference and is an integral and enforceable part of this Order.

V.

Terms and Conditions of Order

5.1. Definitions. Unless otherwise specified, the definitions set forth in Chapter 70.105D RCW and Chapter 173-340 WAC shall control the meanings of the terms used in this Order.

5.2. Public Notices. RCW 70.105D.030(2)(a) requires that, at a minimum, this Order be subject to concurrent public notice. Ecology shall be responsible for providing such public notice and reserves the right to modify or withdraw any provisions of this Order should public comment disclose facts or considerations which indicate to Ecology that the Order is inadequate or improper in any respect.

5.3. Remedial Action Costs. CNG shall pay to Ecology costs incurred by Ecology pursuant to this Order. These costs shall include work performed by Ecology or its contractors for investigations, remedial actions, and Order preparation, oversight and administration. Ecology costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2). CNG shall pay the required amount within ninety (90) days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general description of work performed will be provided upon request. Itemized statements shall be prepared quarterly. Failure to pay Ecology's costs within 90 days of receipt of the itemized statement of costs will result in interest charges.

5.4. Designated Project Coordinators. The Project Coordinator for Ecology is:

Name: Donald W. Abbott
Address: 106 South 6th. Avenue
Yakima Washington, 98902-3387
Phone: (509) 454-7834

The Project Coordinator for CNG is:

Name: Ralph Boyd
Address: Cascade Natural Gas Corporation
222 Fairview Avenue
Seattle, Washington 98109
Phone: (206) 624-3900

The project coordinators shall be responsible for overseeing the implementation of this Order. To the maximum extent possible, communications between Ecology and CNG, and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the project coordinators. Should Ecology or CNG change project coordinators, written notification shall be provided to Ecology or CNG at least ten (10) calendar days prior to the change.

5.5. Performance. All work performed pursuant to this Order shall be under the direction and supervision, as necessary, of a professional engineer or hydrogeologist, or similar expert, with appropriate training, experience, and expertise in hazardous waste site investigation and cleanup. This person, as of the date of this Order, is:

Name: Del Christensen
Address: SEACOR
11040 Main Street, Suite 240
Bellevue, Washington 98004
Phone: (206) 646-0280

CNG shall notify Ecology as to the identity of such engineer(s) or hydrogeologist(s), and of any contractors and subcontractors to be used in carrying out the terms of this Order, in advance of their involvement at the Site.

5.6. <u>Access.</u> Ecology or any Ecology authorized representative shall have the authority to enter and freely move about the Site at all reasonable times for the purposes of, <u>inter alia</u>: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Order; reviewing the progress in carrying out the terms of this Order; conducting such tests or collecting samples as Ecology or the project coordinator may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Order; and verifying the data submitted to Ecology by CNG. By signing this Agreed Order, CNG agrees that this Order constitutes reasonable notice of access, and agrees to allow access to the Site at all reasonable times for purposes of overseeing work performed under this Order. All parties with access to the Site pursuant to this paragraph shall comply with approved health and safety plans. Ecology shall allow split or replicate samples to be taken by CNG during an inspection unless doing so interferes with Ecology's sampling. CNG shall allow split or replicate samples to be taken by Ecology and shall provide seven (7) days notice before any sampling activity.

5.7. <u>Public Participation.</u> CNG shall prepare and/or update a public participation plan for the site. Ecology shall maintain the responsibility for public participation at the Site. CNG shall help coordinate and implement public participation for the Site.

5.8. <u>Retention of Records.</u> CNG shall preserve in a readily retrievable fashion, during the pendency of this Order and for ten (10) years from the date of completion of the work performed pursuant to this Order, all records, reports, documents, and underlying data in its possession relevant to this Order. Should any portion of the work performed hereunder be undertaken through contractors or agents of CNG, then CNG agrees to include in their contract with such contractors or agents a record retention requirement meeting the terms of this paragraph.

5.9. Dispute Resolution. CNG may request Ecology to resolve disputes which may arise during the implementation of this Order. Such requests shall be in writing and directed to the signatory, or his/her successor(s), to this Order. Ecology resolution of the dispute shall be binding and final. CNG is not relieved of any requirement of this Order during the pendency of the dispute and remains responsible for timely compliance with the terms of the Order unless otherwise provided by Ecology in writing.

5.10. Reservation of Rights/No Settlement. This Agreed Order is not a settlement under Chapter 70.105D RCW. Ecology's signature on this Order in no way constitutes a covenant not to sue or a compromise of any Ecology rights or authority. Ecology will not, however, bring an action against CNG to recover remedial action costs paid to and received by Ecology under this Agreed Order. In addition, Ecology will not take additional enforcement actions against CNG to require those remedial actions required by this Agreed Order, provided CNG complies with this Agreed Order.

Ecology reserves the right, however, to require additional remedial actions at the Site should it deem such actions necessary.

Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the releases or threatened releases of hazardous substances from the Cascade Natural Gas Corporation Site.

By entering into this Order, CNG agrees not to petition Ecology for reimbursement of costs incurred in complying with this Order. This agreement does not constitute a waiver of any right of action that CNG may have against any party other than Ecology. This agreement is not intended to affect or prejudice any such rights of action. CNG expressly reserves its rights to seek to recover any costs previously incurred in investigating or remediating the Site, or specifically incurred in implementing this Order, from any other potentially liable party, including the County.

In the event Ecology determines that conditions at the Site are creating or have the potential to create a danger to the health or welfare of the people on the Site or in the surrounding area or to the environment, Ecology may order CNG to stop further implementation of this Order for such period of time as needed to abate the danger.

Ecology and CNG may modify this Order by mutual written agreement.

5.11. Transference of Property. No voluntary or involuntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Site shall be consummated by CNG without provision for continued implementation of all requirements of this Order and implementation of any remedial actions found to be necessary as a result of this Order.

Prior to transfer of any legal or equitable interest CNG may have in the Site or any portions thereof, CNG shall serve a copy of this Order upon any prospective purchaser, lessee, transferee, assignee, or other successor in such interest. At least thirty (30) days prior to finalization of any transfer, CNG shall notify Ecology of the contemplated transfer.

5.12. Compliance with Other Applicable Laws. All actions carried out by CNG pursuant to this Order shall be done in accordance with all applicable federal, state, and local requirements.

VI.

Satisfaction of this Order

The provisions of this Order shall be deemed satisfied upon CNG's receipt of written notification from Ecology that CNG has completed the remedial activity required by this Order, as amended by any modifications, and that all other provisions of this Agreed Order have been complied with.

VII.

Enforcement

7.1. Pursuant to RCW 70.105D.050, this Order may be enforced as follows:

A. The Attorney General may bring an action to enforce this Order in a state or federal court.
B. The Attorney General may seek, by filing an action, if necessary, to recover amounts spent by Ecology for investigative and remedial actions and Orders related to the Site.
C. In the event CNG refuses, without sufficient cause, to comply with any term of this Order, CNG will be liable for:
   (1) up to three times the amount of any costs incurred by the state of Washington as a result of its refusal to comply; and
   (2) civil penalties of up to $25,000 per day for each day it refuses to comply.
D. This Order is not appealable to the Washington Pollution Control Hearings Board. This Order may be reviewed only as provided under Section 6 of Chapter 70.105D RCW.

Effective date of this Order: APR ~~06~~ 15 1994

CASCADE NATURAL GAS CORPORATION

By
Ralph E. Boyd
Vice President

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

By
Anthony W. Grover
Section Manager
Toxics Cleanup Program
Central Regional Office

AWG:DWA:vw
g:\don\agord.cng

EXHIBIT A

SEACOR

**REVISED WORK PLAN FOR
REMEDIAL INVESTIGATION AND ASSESSMENT OF
GROUNDWATER REMEDIATION ALTERNATIVES
FOR
CASCADE NATURAL GAS CORPORATION**

512 Decatur Avenue
Sunnyside, Washington

Submitted by
SEACOR

For
Mr. Tom Lindley
Miller, Nash, Wiener, Hager & Carlsen
3500 U.S. Bancorp Tower
111 S.W. Fifth Avenue
Portland, Oregon 97204-3699

July 13, 1993

RECEIVED
JUL 15 1993
DEPARTMENT OF ECOLOGY
CENTRAL REGION OFFICE

Prepared by:

Gordon W. Shaffer
Associate Scientist

Reviewed by:

for
Del Christenson
Principal Scientist

11040 Main Street
Suite 240
Bellevue, WA 98004
(206) 646-0280
(206) 646-0283 FAX

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FIGURES

APPENDICES

1.0 INTRODUCTION

The Cascade Natural Gas (CNG) facility (site) is located at 512 Decatur Avenue, Sunnyside, Washington (Figure 1). The site is situated within the downtown district of Sunnyside. Environmental assessment activities were initiated at the site during the removal of four underground storage tanks (USTs) in September 1990. Since removal of the USTs, Washington State Department of Ecology (Ecology) has conducted a Site Hazard Assessment (SHA) and has assigned the site a Number 1 ranking. This ranking is the highest priority that Ecology assigns.

The primary purpose of this Work Plan is to assess the lateral extent and potential migration pathways of petroleum hydrocarbons in the groundwater due to releases from former underground storage tanks at the site. A secondary objective will focus on the potential effect of the County drain and associated backfill on groundwater and chemical migration. Once this information has been obtained, remedial activities will be evaluated which will focus on reducing the concentration of petroleum hydrocarbons in groundwater. These activities are designed to prevent the off-site migration of petroleum hydrocarbons.

This Work Plan is based on information generated during previous investigations conducted at the site. The previous investigations concluded that petroleum hydrocarbons were present in soil and groundwater at the site. Additionally, low concentrations of volatile organic compounds (VOCs) were detected in the soil and groundwater. However, no on-site source for VOCs has been identified. Petroleum-affected soils above the saturated zone have been excavated and have been remediated by landfarming at the Terrace Heights Landfill in Yakima, Washington. An extensive assessment of groundwater conditions at the site has not yet been implemented; however, water level monitoring data from three on-site wells indicate that groundwater flow beneath the site is to the southwest. Laboratory analyses of groundwater samples collected at the site indicate that petroleum hydrocarbon compounds are present in the groundwater at concentrations above Washington Model Toxics Control Act (MTCA) Method A cleanup levels (WAC Chapter 173-340). As a result of the presence of these compounds in the groundwater, Ecology has recommended in a letter to SEACOR, dated September 18, 1991, the implementation of a focused Remedial Investigation/Feasibility Study (RI/FS) in accordance with WAC Chapter 173-340-350. Ecology requested that the RI/FS be completed on a priority basis, but Ecology was then unable to provide timely review and appears to have withdrawn from the Consent Order process. These remedial activities are therefore now being conducted as an Independent Cleanup Action.

Based on the data gathered to date and the necessary components of the RI, the following tasks are anticipated:

- Task 1 -- Survey of existing wells and pertinent on- and off-site reference points.
- Task 2 -- Assess water levels in on- and off-site wells and drains.
- Task 3 -- Assess the County drain and the surrounding backfill.

- Task 4 -- Install groundwater monitoring wells.
- Task 5 -- Sample monitoring wells and analyze groundwater samples.
- Task 6 -- Identify data gaps and remedial action alternatives.
- Task 7 -- Prepare focused RI/FS report.

Each of the above Tasks is described in detail in Section 2.0.

2.0 SCOPE OF WORK

2.1 TASK 1 -- SURVEY OF EXISTING WELLS AND PERTINENT ON- AND OFF-SITE REFERENCE POINTS

The vertical and horizontal coordinates of the three existing groundwater monitoring wells will be surveyed relative to a United States Coast & Geologic Survey (USC & GS) Datum located in downtown Sunnyside. A survey mark will be placed on the top of each well casing. Additionally, survey points are planned for manhole covers adjacent to the facility (above the County drain), for one well at the United Telephone facility, as well as on-site reference points. A survey map will be prepared that documents the surveying results. The survey map will be used as the base map for a groundwater contour map.

2.2 TASK 2 -- ASSESS WATER LEVELS IN ON- AND OFF-SITE WELLS AND DRAINS

Subsequent to preparing a site survey map, SEACOR will measure the water level in all of the existing monitoring wells, in the County drain (if water is present) and in a monitoring well located on the United Telephone facility southwest of the site. The data gathered will be utilized in assessing desirable locations for potential future monitoring wells. Additionally this information will be utilized to aid in assessing the effect (if any) of the County drain on groundwater elevations at the site. SEACOR will collect water samples from two manways (one upgradient and one downgradient) that provide access to the drain. The two manways are located in the middle of Decatur Avenue along the southern side of the CNG site.

2.3 TASK 3 -- ASSESS THE COUNTY DRAIN AND THE SURROUNDING BACKFILL

To further assess the groundwater flow direction at the site, SEACOR will assess the depth and materials surrounding the County drain and the potential effect operation of the drain has had on contaminant migration. Preliminary findings suggest that the drain was installed before 1921. A review of available drawings indicates that the drain was buried at a depth of approximately 14 feet. It is believed that the drain was constructed of clay pipe with loose-fitting bell joints. Backfill material used around the drain has not been determined. However, based on verbal information related by the Rosa Irrigation District, SEACOR believes that straw may have been used. It has been reported that the drain was installed to lower the water table which had been artificially raised by irrigation activity in the surrounding vicinity.

The soil and groundwater conditions surrounding the drain will be assessed utilizing an exploratory boring. The boring will be advanced as close as practicable to the drain and to an approximate depth of 16 feet below grade. Soil information gathered while advancing the boring will be utilized to assess the backfill material. After reaching the target depth, the boring will be converted into a groundwater monitoring well. The monitoring well will be utilized to monitor water levels and selected analytical parameters in the groundwater adjacent to the drain backfill. The drilling and sampling procedures will be in accordance with the protocols outlined in Appendices A, C, D and E of this Work Plan.

2.4 TASK 4 -- INSTALL GROUNDWATER MONITORING WELLS AND CONDUCT AQUIFER TESTS

Three groundwater monitoring wells (MW-1, MW-2 and MW-3) are currently present at the CNG site. Monitoring of these wells indicates that a petroleum hydrocarbon plume from the former USTs is present. However, the existing well network does not allow a complete definition of the extent of the plume. To further assess the extent of the plume, four additional 20-foot deep monitoring wells are proposed to be installed using the procedures outlined in Appendices A, C, and E. These four wells will be in addition to the one well described under Task 3 (Section 2.3).

Proposed locations for the wells are shown on Figure 2. The four additional proposed monitoring wells will be located as follows:

- On the south side of Decatur Avenue on a line parallel with the western edge of the CNG office building. This well location will provide additional downgradient information;

- On the west side of Fifth Street, approximately 25 to 50 feet south of the County drain. This well location will provide additional downgradient information with respect to the County drain as well as the site;

- On the west side of Fifth Street, approximately 25 to 50 feet north of the County drain. Additional downgradient information will be gained from this well point; and

- On the west side of Fifth Street approximately 75 to 100 feet north of the County drain. Cross gradient information will be gained from this well location.

It is anticipated that each of the wells will be placed within public easements (sidewalks). These locations will require approval from the City of Sunnyside. Additionally, a traffic safety plan will likely be required.

Aquifer characteristics may be evaluated by conducting aquifer tests. If tests are conducted they will consist of a step-drawdown test to estimate well yield, and a constant rate test to estimate aquifer transmissivity. These tests, if necessary, will be conducted using existing monitoring well MW-3 (southwest corner of the site). Aquifer testing procedures and methods are outlined in Appendix B. To enable collection of sufficient data during the constant rate test, it will be necessary to install an observation well in close proximity to MW-3, approximately 15 feet away from MW-3. The well will be installed near MW-3 according to the procedures outlined in Appendix C.

Water generated during the sampling of wells and during the aquifer pump test will be contained on-site pending determination of a proper disposal method. The disposal method will be selected based on analytical testing and coordinated with Ecology. Potential disposal options for the water include discharge to the sanitary sewer, discharge to the storm drain, and reinjection. Due to the potential difficulties in obtaining a National Pollution Discharge Elimination System (NPDES) permit for discharge to the storm drain, it is likely that either sanitary sewer discharge or reinjection will be recommended. If a permit can be obtained, discharge to the sanitary sewer is likely to be the most cost-effective discharge option.

2.5 TASK 5 -- SAMPLE MONITORING WELLS AND ANALYZE GROUNDWATER SAMPLES

To assess the concentration of petroleum hydrocarbons in groundwater, each monitoring well at the site will be sampled. It is anticipated that eight ground water samples will be collected and analyzed. Five soil samples, collected during the installation of the new monitoring wells, will also be analyzed. Additionally, it is anticipated that two water samples collected from the County drain will be analyzed. The samples collected at the site will be analyzed for total petroleum hydrocarbons (TPH) as gasoline using Washington State Method WTPH-G, for TPH as diesel using Washington State Method WTPH-D and for benzene, toluene, ethyl benzene and xylenes using EPA Method 8020. The collected samples will be handled and analyzed in accordance with the protocols outlined in Appendices D and E.

2.6 TASK 6 -- IDENTIFY DATA GAPS AND REMEDIAL ACTION ALTERNATIVES

After completing Tasks 1, 2, 3, 4 and 5, SEACOR will reduce and analyze collected data. The data will be complied and assessed to identify data gaps. If significant data gaps are detected then follow-up activities may be necessary. These activities may include further definition of the extent of downgradient contamination. Additionally, the data will be utilized to assess appropriate remedial action alternatives. The remedial action alternatives will be discussed with CNG. After selecting the most desirable remedial option, SEACOR will discuss the implementation of that option with Ecology.

2.7 TASK 7 -- PREPARE FOCUSED RI/FS REPORT

An evaluation of data obtained during the above investigation will be provided to CNG in a draft report. After comments from CNG are received, a final report will be prepared. If no significant data gaps have been identified then the report may serve as the Remedial Investigation/Feasibility Study report required by WAC 173-340-350. If additional investigations are necessary, SEACOR will present specific recommendations to CNG.

3.0 SCHEDULE

The scope of work presented in this Work Plan can be completed within approximately 17 weeks after receiving authorization to proceed (Figure 3). Due to the uncertainty of water quality at the proposed well locations, additional work may be necessary to sufficiently characterize the extent of petroleum hydrocarbons in groundwater. If additional work is necessary, the schedule will be modified accordingly.

Our project schedule assumes that work will commence by the end of July 1993. In addition, timely implementation of the groundwater investigation will be require the consent of the City of Sunnyside or adjacent property owners, where the wells are proposed to be located.

4.0 SITE CLOSURE

The results of the work completed in accordance with Section 2.0 will determine the course of subsequent activities at the site. Specifically, one of two scenarios is possible, depending on the chemical results of samples from proposed monitoring wells MW-7 and MW-8 (Figure 2). Each scenario and the resultant course of action is described below.

4.1 SCENARIO 1

Scenario 1 is where groundwater samples from monitoring wells downgradient (south) of the county drain (i.e., MW-7 and MW-8) show chemical concentrations of all analyzed constituents of concern (as listed in Task 5 of the Work Plan) below MTCA Method A cleanup levels (as specified in WAC 173-340-720, Table 1). Under Scenario 1, the following actions will be taken:

- No aquifer testing, as described in Task 4, will be performed.
- No feasibility study, as described in Task 7, will be prepared.
- In place of a feasibility study, a groundwater monitoring program will be implemented at the site. The monitoring program will include measuring water levels in all wells at the site and collecting water quality samples from selected wells at quarterly intervals for a three-year period. Reports will be provided within 30 days after monitoring takes place.
- If, at the end of the three-year monitoring period, the concentrations of the chemicals of concern in the wells selected for monitoring remain below MTCA Method A cleanup levels, the CNG site will be considered closed and no further action will be taken.

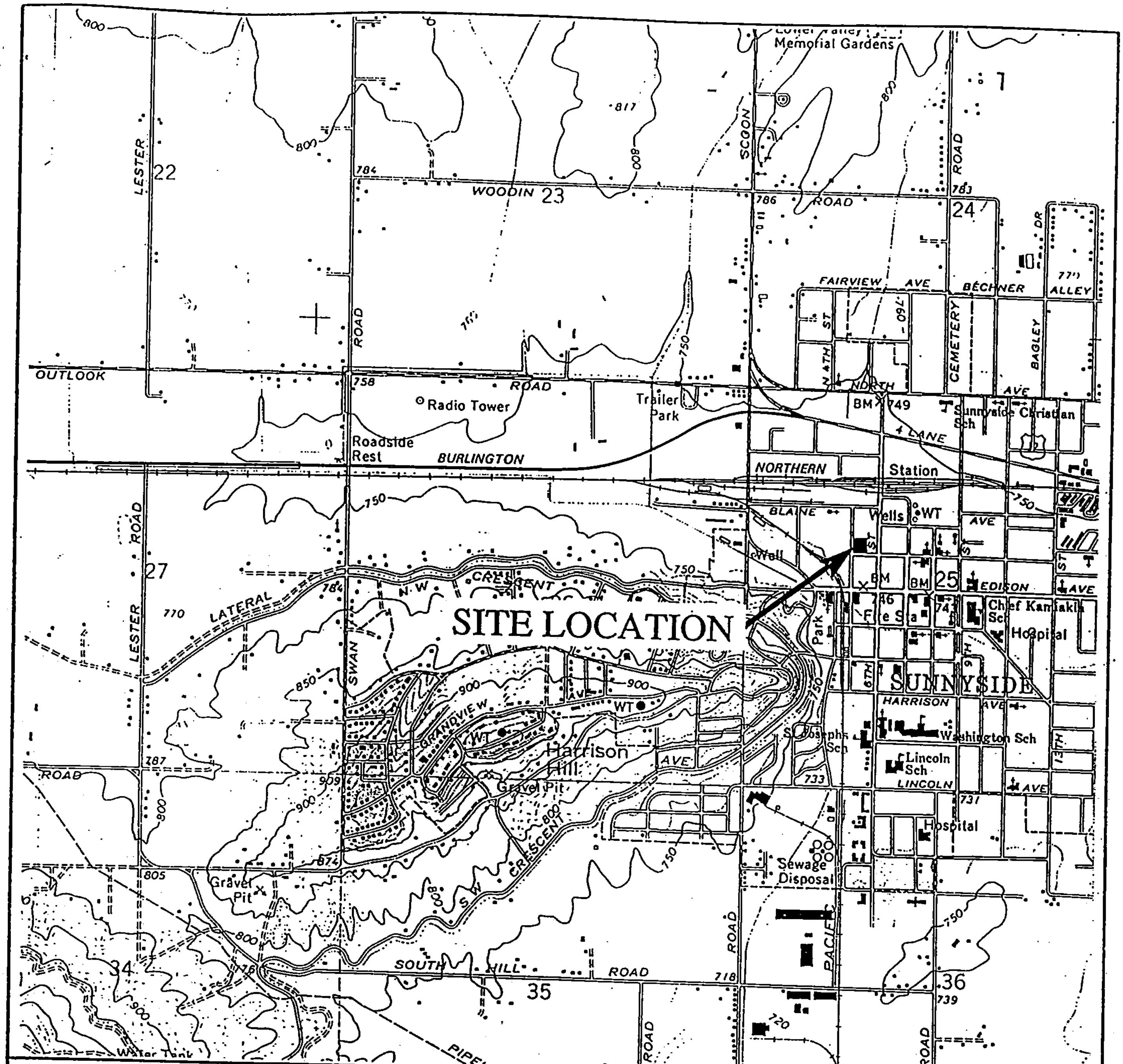
4.2 SCENARIO 2

Scenario 2 is where groundwater samples from monitoring wells MW-7 and MW-8 show a concentration of any analyzed constituent of concern over its respective MTCA Method A cleanup level. Under Scenario 2, the following actions will be taken:

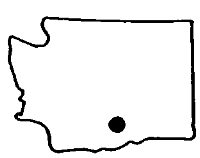
- An aquifer test will be performed in accordance with Task 4.
- A focused feasibility study will be prepared as described in Task 7. As part of the feasibility study, a risk assessment will be performed for all constituents of concern detected in wells selected for monitoring which are in excess of MTCA Method A cleanup levels. This risk assessment will be performed in accordance with a Method B calculation (as described in WAC 173-340-720).

- If the concentrations of all analyzed constituents of concern in wells selected for monitoring are below Method B cleanup levels, a monitoring program will be implemented in accordance with Scenario 1, except that results will be compared to the calculated Method B cleanup levels. If concentrations of all analyzed constituents of concern in wells selected for monitoring remain below MTCA Method B cleanup levels for a period of three years the site will be considered closed and no further action will be taken.

- If the concentration of any analyzed constituent of concern in wells selected for monitoring is above its respective Method B cleanup level, alternatives for groundwater remediation will be evaluated in the feasibility study and a remedial action plan for the site will be developed.



REFERENCE: USGS 7.5 X 15 MINUTE QUADRANGLE, SUNNYSIDE, WASHINGTON, 1978.



WASHINGTON

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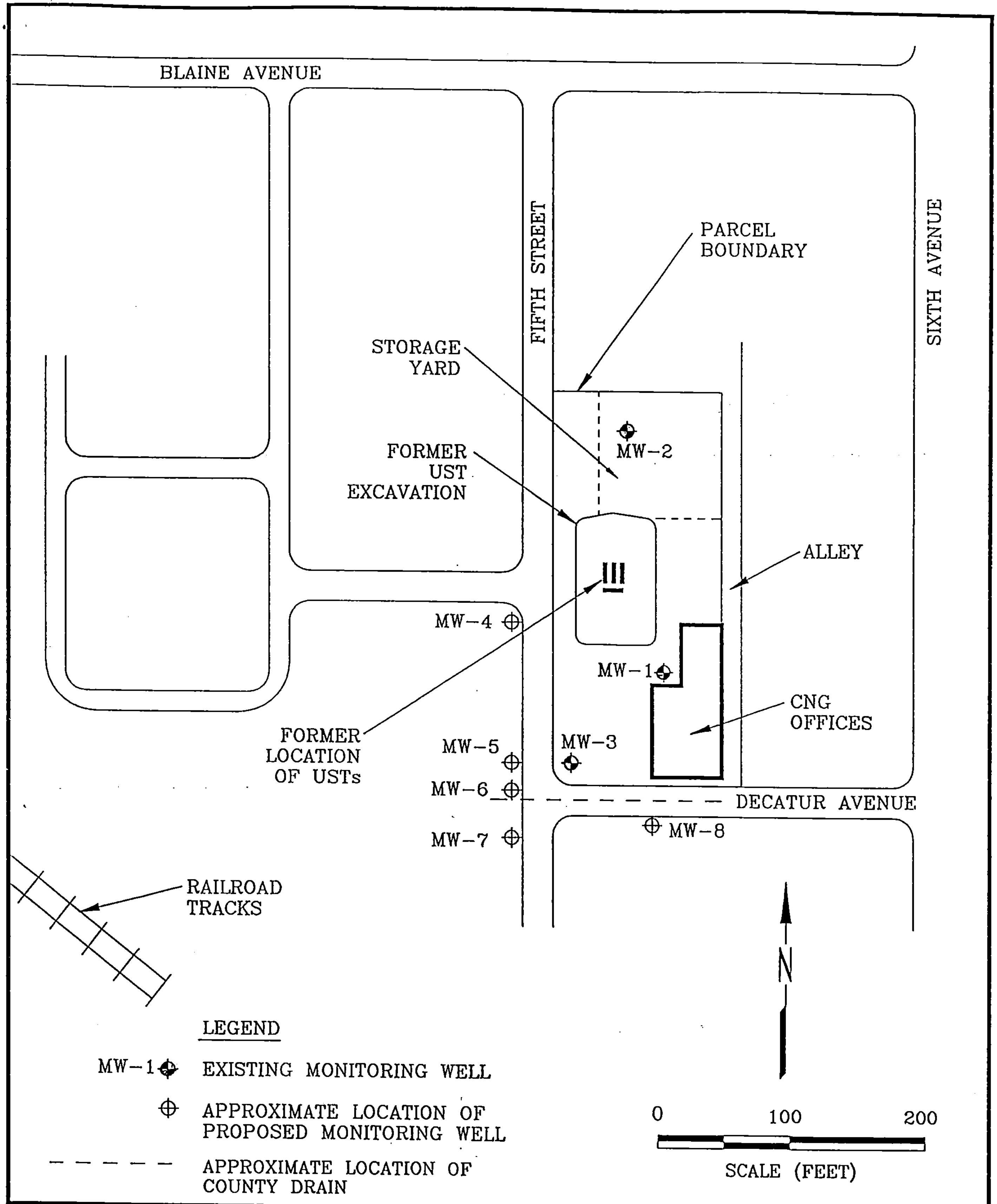
SCALE (MILES)

SEACOR	DWN JC APPR PFS DATE 7/91 JOB# 00058-014-01	FIGURE 1 SITE LOCATION MAP CASCADE NATURAL GAS SUNNYSIDE, WASHINGTON

DWG: 8X11BAS



SEACOR	DWN RB APPR DATE 9/13/92 JOB# 00058-014-01	FIGURE 2 PROPOSED MONITORING WELL LOCATIONS CASCADE NATURAL GAS SUNNYSIDE, WASHINGTON

DISK:0019 DWG:CNGSUN25

FIGURE 3
PLANNING/SCHEDULE CHART
FOR
CASCADE NATURAL GAS, SUNNYSIDE, WASHINGTON

△ = START OR COMPLETION

◇ = REPORT

TITLE | PAGE 1 OF 1 | DATE July 1992

OBJECTIVE / WEEK	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Review of Work Plan by CNG	△		△																							
Site Survey			△	△																						
Evaluation of Water Levels				△	△																					
Assessment of County Drain				△	△																					
Install Monitoring Wells					△	△																				
Develop and Sample Monitoring Wells						△	△																			
Sample Analysis							△		△																	
Identification of Data Gaps and Remedial Action Alternatives									△			△														
Draft Report for CNG Review									△					◇												
Final RI/FS Report													△				◇									

APPENDIX A

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS				TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS LARGER THAN No. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN No. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN No. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL-GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE-GRAINED SOILS MORE THAN HALF IS SMALLER THAN No. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLACTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY; GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLACTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGINIC SILTS
HIGHLY ORGANIC SOILS			PL	PEAT AND OTHER HIGHLY ORGANIC SOILS

KEY TO BORING LOG

[hatched box] = Undisturbed soil sample

[dotted box] = Classification sample

[lined box] = No sample recovery

▽ = Water Level

NA = Not Applicable

BLOWS = Blows required to drive sampler 18 inches in 6 inch intervals with a 140 pound hammer falling 30 inches.

PID = Photoionization detector reading (10.2 electron-volt lamp. Calibrated using an isobutylene standard gas).

* = Sample submitted for chemical analysis.

SEACOR	DWN ______ APPR______ DATE ______ JOB# ______	SOIL CLASSIFICATION CHART AND KEY TO SEACOR BORING LOGS

DISK:0012 DWG:EXXREN03

APPENDIX B

AQUIFER TESTING PROCEDURES

APPENDIX B
AQUIFER TESTING PROCEDURES

INTRODUCTION

This appendix presents the procedures to perform the proposed aquifer tests discussed in Section 1.4. The purpose of the aquifer tests are to provide hydrologic data on selected aquifer characteristics. The data collected will be used to assess the feasibility of the groundwater extraction.

AQUIFER TESTS

Aquifer testing will consist of two tests: a step drawdown test followed with a constant discharge test. The step drawdown test will be performed to assess the optimum sustainable rate for pumping during the constant discharge test. Once a discharge rate has been selected, the constant discharge test is performed to evaluate the hydraulic properties of the aquifer, fluid transport characteristics and groundwater extraction system parameters.

Step Drawdown Test Procedures

Prior to conducting the step drawdown test, background information will be reviewed regarding any site-specific hydrogeologic information. Existing information such as soil type and well development performance can be used to estimate a maximum expected pumping rate for the well to be tested. Incremental pumping rates for the step drawdown test will then be selected based on the maximum expected pumping rate.

The step drawdown test will be performed as a series of constant discharge tests, starting the with lowest selected rate. The water level in the pumping well will be monitored using a water level indicator or pressure transducer. After the water level has stabilized, the pumping rate will be increased to the next selected rate. Again, the water level will be monitored. The step drawdown test generally consists of three pumping rates. In addition, pre-selected pumping rates may be modified during the test if change in water levels is negligible or too dramatic. The pumping rate at any step will not be reduced to a rate less than used in the previous step.

In selecting a pumping rate for the constant discharge test, the projected drawdown of the constant discharge (based on the step drawdown results) should not exceed approximately 50 percent of the saturated thickness of the well. If drawdown is greater than about 50 percent of the saturated thickness, small increases in pumping rate can lead to large increases in drawdown. Excessive drawdown could result in reducing well efficiency and drying of the well.

Constant Discharge and Recovery Test Procedures

A constant discharge and recovery test will be completed at the site for a duration of 8 hours. Before starting the test, the water level in all wells at the site will be monitored using a water level indicator. During the test, the pumping well (MW-3) and an observation well will be monitored with pressure transducers connected to data logging equipment. The data logger will record readings from the transducers according to the following schedule:

Period of Pumping/Frequency

0-2 minutes/10 seconds
2-5 minutes/30 seconds
5-15 minutes/1 minute
15-60 minutes/5 minutes
1-2 hours/15 minutes
2-5 hours/30 minutes
5-8 hours/1 hour

In addition, manual readings (to provide field data) from selected wells will be taken using a water level indicator. An attempt will be made to follow the same schedule as the data logger. The early portion of the schedule may be difficult to perform manually due to the short time intervals between readings.

The pumping portion of the test is typically performed over a duration of 4 to 6 hours. To determine the actual duration of the test, field drawdown curves will be generated for every well monitored during the test using water level data collected from manual readings. The field drawdown curves consist of plotting drawdown on a linear vertical axis and time on a logarithmic horizontal axis. The field drawdown curves should show a decrease in the change in drawdown over time, indicating an approach to equilibrium conditions. The pump will be stopped when the observed drawdowns approach equilibrium.

Upon deactivation of the pump, the recovery potion of the test will begin. The pump will not be removed until the end of the entire test to avoid water level disturbance. The recovery portion of the test typically is performed over a duration of 2 to 4 hours. Manual soundings and data logger readings will be recorded on a schedule similar to the pumping portion of the test. Recovery will be monitored until the pumping well has recovered at least 80% of the pre-pumping level.

Groundwater Containment and Decontamination Procedures

Pumped groundwater will be piped through a PVC pipe or other hose to a water-tight holding tank and analyzed for petroleum hydrocarbon constituents using Washington State Method WTPH-G, WTPH-D and for BTEX using EPA Method 8020. The analytical results will be reviewed and methods of disposal, including the option of discharge to a sanitary sewer, will be evaluated.

Analytical Procedures

There are two commonly used methods to analyze constant discharge tests; the "type curve matching" and the "straight lines" methods. For "type curve matching," a method presented by Boulton (1963) is used to evaluate transmissivity and storativity. This method considers unconfined conditions with delayed yield.

The solution procedure consists of plotting a drawdown curve for each well and type curves on separate double-logarithmic papers. The plots are superimposed and moved so that the drawdown curve falls on one of the type curves. A unique point is then selected on the type curve plot and values can be selected from the type curve axis. These values are then used in mathematical equations which calculate where transmissivity and storativity.

The governing equation for the "straight line" method was developed by Theis (1940) and later modified by Cooper and Jacob (1946). Transmissivity and storativity are calculated by plotting the observed drawdown data on semi-logarithmic paper. Values of drawdown are plotted on the arithmetic scale and time on the logarithmic scale. The resulting graph is called a time-drawdown plot. A straight line is drawn through the portion of the plot where data points permit. For the straight line, the change in water drawdown over time is measured and transmissivity can then be calculated. Storativity is calculated from the intercept where the plotted straight line intersects the zero-drawdown axis.

The "straight line" method can also be used with a distance-drawdown plot. Distance-drawdown plots are prepared by plotting the drawdown in each of several monitoring well versus the distance to the pumping well. Drawdowns are plotted on the arithmetic scale and distance on the log arithmetic scale. The drawdown readings must be made in all wells at essentially the same time. Under ideal conditions, the data should plot in a straight line. Similar to the "straight line' method for a time-drawdown plot, a straight line is drawn through the data points of the distance drawdown plot. Transmissivity is then calculated based on the slope of the line. Storativity is calculated from the intercept where the straight line intersects the zero drawdown axis.

In practice the data from the pump test are down loaded to a computer and are analyzed with a commercially available software program (Aqtesolv). The program provides data printouts, graphs, and calculates relevant aquifer characteristics.

APPENDIX C

WELL DRILLING METHODS

APPENDIX C
WELL DRILLING METHODS

SOIL BORINGS

A hollow stem auger drilling rig will be used to complete the borings for the monitoring wells at the site. The hollow stem auger drilling rig will be used to bore to depths up to 20 feet below ground surface. All soil borings will be logged for soil characteristics including texture, color, hardness, moisture and other characteristics. Soil samples will be collected for lithologic description and chemical analysis using a split-spoon sampler driven ahead of the auger bit. The split-spoon sampler is lined with three 6-inch brass cylinders with a diameter of 2 or 2.5 inches. The sampler is lowered into the hole with a wireline or on the end of a drill rod. The split spoon is then driven 18 inches with a 140-pound hammer falling 30 inches.

Upon removal from the borehole, the sampler is spilt longitudinally. The first (bottom) 6-inch cylinder is separated by the insertion of a plastic spatula between cylinders. The ends of the cylinder are sealed with teflon and covered with plastic end caps. The end caps are sealed in place with silicon tape. The tube is labeled with the data and time collected, sample and boring number and the sample depth. The sample will be allowed to sit for approximately 15 minutes and a headspace reading will be taken using a photoionization detector (PID). The PID will serve as a field screening tool for VOCs.

One soil sample from each boring will be selected for laboratory analysis. The basis for sample selection will be the sample with the highest PID reading, and the sample at the soil/groundwater interface.

Soil cuttings from the boreholes will be placed into Department of Transportation (DOT)-approved, 55-gallon drums, sealed, labeled and stored on-site pending analytical results.

MONITORING WELLS

The soil borings will be converted into monitoring wells. The well construction will be completed in accordance to rules and regulations as outlined in Chapter 173-160 WAC: Minimum Standards for Construction and Maintenance of Wells.

Monitoring Well Construction

The monitoring wells will be constructed of 4-inch internal diameter (ID) polyvinylchloride (PVC), threaded flush joint casing and slotted well screen. The monitoring wells will be constructed inside the continuous flight augers. Prior to installing the wells, the casing, screen and end caps will be cleaned using a steam cleaner. The length of the casing and the screen interval will be determined based on the water level encountered during drilling. The screen will be set into the first water-bearing unit penetrated, and will allow for seasonal fluctuations in water elevations.

The wells will be completed with an artificial filter pack. The filter pack will consist of a granular, inert, siliceous material of the appropriate size for the well screen. The sand is placed in the augers as they are pulled up and will be continued at least three feet above the top of the well screen.

A surface seal will be placed on top of the sand pack to the surface. It will consist of two feet of bentonite pellets followed by cement grout from the top of the pellets to ground surface. The monitoring wells will be completed below ground. Flush-mounted steel protective covers will be installed at the time of initial grout placement. A cement pad will placed around the cover. Each well will be fitted with a lockable watertight locking cap.

APPENDIX D

SAMPLING METHODS AND PROCEDURES

APPENDIX D
SAMPLING METHODS AND PROCEDURES

MONITORING WELL DEVELOPMENT

Proper development of monitoring well is critical in acquiring representative samples and in restoring natural hydraulic conductivity to the well. Well development will be conducted by means of either a submersible pump or a bottom discharge bailer in combination with a surge block. Development will proceed in the following manner and will meet the following criteria:

- The well water is as free of turbidity as practical.
- The sediment thickness remaining within the well is less than five percent of the screen length.
- Consistent (within ten percent) measurements of pH, temperature, and conductivity are recorded over three consecutive purge volumes.

The field geologist will record field pH, temperature, and conductivity measurements before, during, and after development of each well. Static water levels will be measured and recorded both before and after well development. During development, the pump intake, or bailer stopping point will be lowered and raised periodically throughout the entire water column to maximize development of the screened interval. Pumping will be continuous but at variable rates to ensure the aquifer is adequately stressed and the natural hydraulic conductivity is restored. Water generated during development and groundwater sampling activities will be placed in a water-tight holding tank or DOT-approved drums pending analytical results.

WATER LEVEL MEASUREMENTS

Each well will be checked for free-phase hydrocarbons and water levels before development and before each sampling event. The procedure for collecting water level measurement data is summarized below:

- Record the well number, date, time, and initials of field personnel taking measurements.
- Insert the water level indicator or interface probe until it reaches water. Measure the depth-to-water from the designated measuring point at the top of casing (TOC) and/or depth to free phase hydrocarbons, and record the value to the nearest 0.01 foot. Repeat the procedure three times to insure accuracy.
- Record the make and model of the instrument used.
- Compare total depths and water level to previous measurements.

- Record well conditions (cracked casing, missing cap, subsidence features, etc.) and any other pertinent observations.

- Insure that all markings clearly indicate the well's location and the well number.

WELL SURVEYING

The top of casing elevation of each monitoring well will be determined by level surveying to a nearby USC & GS Datum. The survey point on each well will be clearly marked by cutting a small notch in the top of the well casing. The existing wells and new wells will be surveyed into the same reference elevation.

GROUNDWATER SAMPLING

Groundwater samples will be collected from each existing monitoring well and each newly installed well. The objective of groundwater sampling is to obtain a volume of water that is representative of the chemical quality of the water in the aquifer. The following procedures will be employed to meet this objective:

- The static water level in the well is measured with a water level indicator. This measurement will be used to calculate a casing volume of water. A Teflon or stainless steel bailer or submersible pump is then used to purge a minimum of three casing volumes of water from the well. The purged water will be stored on-site in a water-tight holding tank or DOT-approved drums.

- Purge until pH, conductivity and temperature are constant.

- Field measurements (i.e., pH, conductivity and temperature) will be calibrated against known standards. Instrument response and calibration standards used will be recorded.

- After the wells are purged, groundwater samples will be collected in a decontaminated Teflon or stainless steel bailer or with a disposable polyethylene bailer. The bailer will be lowered into the monitoring well with a dedicated line. The bailer will be lowered below the water level and then slowly retrieved. The sample is drained from the bottom of the bailer, and placed into sample containers that have been cleaned to EPA specifications. When placing the sample in the containers, the seal or lid of the container will not be handled. To preserve the sample integrity, the sample container will be opened only at the moment the sample is to be dispensed from the bailer and then properly sealed to avoid any headspace in the vials.

- Samples will be collected from each monitoring well. One sample from each well will be analyzed for total petroleum hydrocarbons (TPH) as diesel (WTPH-D), TPH as gasoline (WTPH-G) and for BTEX. The containers will be placed immediately in an iced cooler for transport to the laboratory.

APPENDIX E

EQUIPMENT DECONTAMINATION

APPENDIX E
EQUIPMENT DECONTAMINATION

EQUIPMENT DECONTAMINATION

The field equipment decontamination procedures are designed to prevent any cross-contamination from one well or sample to another. The reusable sampling equipment is used once and then is thoroughly cleaned. All plastic tubing and other apparatus that cannot be completely decontaminated or disposable sampling equipment is discarded and new material is used.

SOIL DRILLING EQUIPMENT DECONTAMINATION

Prior to entering the site, all drilling equipment is steam cleaned to remove oils, chemicals, soils and other debris and to prevent cross-contamination. Additional steam cleaning is performed to prevent cross-contamination between borings. Steam cleaning fluids will be contained in a water-tight tank or DOT-approved drums and properly disposed of with other water generated at the site.

SAMPLING EQUIPMENT DECONTAMINATION

Prior to the start of a sampling episode, all reusable equipment is cleaned. To clean the sampling equipment, all equipment is placed in a cleaning solution of Liqui-Nox soap and water. Components will be allowed to soak for approximately five minutes, brushed inside and out, and removed from the solution. They will be rinsed repeatedly with tap water and a final rinse with distilled water.

AQUIFER TESTING EQUIPMENT

Following aquifer testing, the pump and pressure transducers will be removed and decontaminated. Decontamination procedures will consist of a soap wash and tap water rinse. Rinse water will be contained and placed in the purged water holding tank or into DOT-approved 55-gallon steel drums.

October 16, 1992

SEACOR
Science & Engineering
Analysis Corporation

Mr. John Wietfeld
Engineer - Toxics Cleanup Program
Department of Ecology
106 South 6th Avenue
Yakima, WA 98902-3387

Dear Mr. Wietfeld:

This letter has been prepared in response to our phone conversation of October 6, 1992, concerning the Consent Decree for the Cascade Natural Gas (CNG) site in Sunnyside, Washington.

We have prepared an addendum to the "Revised Work Plan for Remedial Investigation and Assessment of Groundwater Remediation Alternatives for Cascade Natural Gas Corporation", dated July 23, 1992. The addendum, which is attached to this letter, discusses conditions for site closure as we discussed.

The Work Plan addendum presents two scenarios based on the results of samples from proposed wells MW-7 and MW-8 (see Figure 2, Work Plan). Under Scenario 1, the groundwater will be monitored for a period of one year and then the site will be considered closed. Under Scenario 2, a feasibility study and a remedial action plan will be prepared. However, implementation of any required remedial action at the site will be addressed either in an addendum to the Consent Decree which is being processed or in a separate Consent Decree.

It is anticipated that the attached addendum will be incorporated as "Section 4.0 - Site Closure" into the Revised Work Plan and, by reference, will become part of the Consent Decree for the site.

Please call if you have any questions.

Very truly yours,

Del Christenson

Del Christenson
Principal Scientist

Attachment

cc: Mr. Ralph Boyd - CNG
Mr. Thomas E. Lindley - Miller, Nash, et. al.

lp/dc/wietfeld.ltr

ADDENDUM NO. 1
to the
"REVISED WORK PLAN FOR REMEDIAL INVESTIGATION AND ASSESSMENT OF GROUNDWATER REMEDIATION ALTERNATIVES FOR CASCADE NATURAL GAS CORPORATION"
DATED JULY 23, 1992

SECTION 4.0 SITE CLOSURE

The results of the work completed in accordance with Section 2.0 will determine the course of subsequent activities at the site. Specifically, one of two scenarios is possible, depending on the chemical results of samples from proposed monitoring wells MW-7 and MW-8 (Figure 2). Each scenario and the resultant course of action is described below.

4.1 SCENARIO 1

Scenario 1 is where groundwater samples from monitoring wells downgradient (south) of the county drain (i.e., MW-7 and MW-8) show chemical concentrations of all analyzed constituents of concern (as listed in Task 5 of the Work Plan) below MTCA Method A Cleanup Levels (as specified in WAC 173-340-720, Table 1). Under Scenario 1, the following actions will be taken:

1. No aquifer testing, as described in Task 4, will be performed.

2. No feasibility study, as described in Task 7, will be prepared.

3. In place of a feasibility study, a groundwater monitoring program will be implemented at the site. The monitoring program will include measuring water levels in all wells at the site and collecting water quality samples at MW-7 and MW-8 at quarterly intervals for a one-year period.

4. If, at the end of the one-year monitoring period, the concentrations of the chemicals of concern in MW-7 and MW-8 remain below MTCA Method A Cleanup Levels, the CNG site will be considered closed and no further action will be taken.

4.2 SCENARIO 2

Scenario 2 is where groundwater samples from monitoring wells MW-7 and MW-8 show a concentration of any analyzed constituent of concern over its respective MTCA Method A Cleanup Level. Under Scenario 2, the following actions will be taken:

- An aquifer test will be performed in accordance with Task 4.

- A focused feasibility study will be prepared as described in Task 7. As part of the feasibility study, a risk assessment will be performed for all constituents of concern detected in wells MW-7 and MW-8 which are in excess of MTCA Method A Cleanup Levels. This risk assessment will be performed in accordance with a Method B calculation (as described in WAC 173-340-720).

- If the concentrations of all analyzed constituents of concern in wells MW-7 and MW-8 are below Method B Cleanup Levels, a monitoring program will be implemented in accordance with Scenario 1, except that results will be compared to the calculated Method B Cleanup Levels. If concentrations of all analyzed constituents of concern in MW-7 and MW-8 remain below MTCA Method B Cleanup Levels for a period of one year, the site will be considered closed and no further action will be taken.

- If the concentration of any analyzed constituent of concern in wells MW-7 and MW-8 is above its respective Method B Cleanup Level, alternatives for groundwater remediation will be evaluated in the feasibility study and a remedial action plan for the site will be developed.

March 15, 1993

SEACOR
Science & Engineering
Analysis Corporation

Mr. John Wietfeld
Engineer - Toxics Cleanup Program
Department of Ecology
106 South 6th Avenue
Yakima, WA 98902-3387

SUBJECT: MODIFICATIONS TO REVISED WORK PLAN FOR REMEDIAL INVESTIGATION AND ASSESSMENT OF GROUNDWATER REMEDIATION ALTERNATIVES - CASCADE NATURAL GAS CORPORATION, SUNNYSIDE, WASHINGTON

Dear Mr. Wietfeld:

This letter presents minor modifications to the "Revised Work Plan for Remedial Investigation and Assessment of Groundwater Remediation Alternatives for Cascade Natural Gas Corporation" (Work Plan) dated July 23, 1992, and Addendum No. 1, dated July 23, 1992. These modifications were discussed with you during a March 3, 1993 conference call between representatives of Cascade Natural Gas, the Washington State Attorney General's Office and yourself.

The following modifications reference specific sections in the Work Plan and Addendum No. 1 (changes underlined, as appropriate):

- Figure 3

  - Change title of final schedule item ("Final RI/FS Report (Task 7)") to read (changes underlined, as appropriate):

    "RI/FS Report to Ecology (Task 7)"

  - Change "Anticipated Start" from "October 1992" to "April 1993".

- Addendum No. 1

  - Change Page 1, Item 3, Sentence 2 to read:

    "The monitoring program will include measuring water levels in all wells at the site and collecting water quality samples from selected wells at quarterly intervals for a three-year period."

  - Change Page 1, Item 4 to read:

    "If, at the end of the three-year monitoring period, the concentrations of the chemicals of concern in the wells selected for monitoring remain below MTCA Method A Cleanup Levels, the CNG site will be considered closed and no further action will be taken."

- Change Page 2, Bullet #2 as follows:

  Replace "MW-7 and MW-8" with "selected for monitoring".

- Change Page 2, Bullet #3, Sentence 1 as follows:

  Replace "MW-7 and MW-8" with "wells selected for monitoring".

- Change Page 2, Bullet #3, Sentence 2 as follows:

  Replace "MW-7 and MW-8" with "wells selected for monitoring". Replace "one year" with "three years".

- Change Page 2, Bullet #4 as follows:

  Replace "MW-7 and MW-8" with "wells selected for monitoring".

I trust that these modifications reflect our discussions as they relate to the Work Plan. Please call if you have any questions.

Very truly yours,

Science & Engineering Analysis Corporation

Copy

Del Christenson
Principal Scientist

cc: Ralph Boyd - Cascade Natural Gas
Tom Lindley - Miller, Nash, et. al.

January 21, 1994

Mr. Jim Chulos
Washington State Department of Ecology
106th South Sixth Avenue
Yakima, WA 98902-3387

RE: CASCADE NATURAL GAS, 512 EAST DECATUR AVENUE, SUNNYSIDE, WASHINGTON

Dear Mr. Chulos:

On behalf of Cascade Natural Gas Corporation, this letter transmits one copy of *Exhibit A Addendum Remedial Investigation and Assessment of Groundwater Remedial Alternatives.* This Addendum, dated January 21, 1994, addresses the issues raised by Mr. Donald Abbott during a meeting at your offices on December 27, 1993. At Mr. Abbott's request, this Addendum is being submitted to you, as Mr. Abbott is temporarily overseas on vacation. Cascade Natural Gas Corporation and SEACOR understand that Mr. Abbott will be unavailable for approximately one month.

Cascade Natural Gas Corporation is eager to complete negotiations and arrive at a completed Agreed Order.

Please feel free to contact Mr. Ralph Boyd of Cascade Natural Gas Cooperation at (206) 624-3900 if you have any questions or comments.

Sincerely,

Science & Engineering Analysis Corporation

Gordon W. Shaffer
Associate Scientist

cc: Ralph Boyd - CNG
Tom Lindley - Miller, Nash et al
Del Christensen - SEACOR

CA4030.LTR/5
01/21/94

January 21, 1994

Mr. Thomas E. Lindley
Miller, Nash, Wiener, Hager & Carlsen
3500 US Bancorp Tower
111 SW Fifth Avenue
Portland, Oregon 97204-3694

ADDENDUM TO THE JULY 13, 1993 REVISED WORK PLAN FOR REMEDIAL INVESTIGATION AND ASSESSMENT OF GROUNDWATER ALTERNATIVES FOR CASCADE NATURAL GAS CORPORATION, 512 EAST DECATUR AVENUE, SUNNYSIDE, WASHINGTON
SEACOR JOB NO. 00058-019-01

Dear Mr. Lindley:

The attached work plan addendum has been prepared pursuant to the November 3, 1993 request from the Washington State Department of Ecology (Ecology), a December 7, 1993 meeting between representatives from Cascade Natural Gas Corporation (CNG); Miller, Nash, Wiener, Hager & Carlsen (Miller-Nash); and SEACOR; and a December 27, 1993 meeting between Ecology, CNG, Miller-Nash, and SEACOR.

This addendum provides for conducting two additional tasks during the investigation of the Sunnyside CNG facility. Task 1 provides for more fully assessing groundwater flow direction and the potential sources of the VOC and SVOC compounds that have been detected during previous facility investigations. This task includes assessing sewer and/or drains that may be present under Fifth Street, installing two groundwater monitoring wells upgradient of the CNG facility, and installing one groundwater monitoring well near the southern boundary of the CNG site. Task 2 provides for collecting and analyzing groundwater samples from selected wells for specific volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) that have been previously detected in media samples collected at the CNG facility. During the December 27, 1993 meeting Ecology also requested that CNG provide the following additional data:

- The final discharge point of the county drain that underlies East Decatur Avenue.

- The discharge point of Stormdrain-1 and Stormdrain-2 located on the CNG facility. Ecology also requested that soil samples be collected from the bottom of the two onsite storm drains in the event that they were determined to be drywells. This addendum provides these two additional data as well as the discharge location of two interior drains located in the shop area of the CNG facility.

Task 1

As we discussed during our December 7 and 27 meetings, there may be one or more upgradient or offsite sources of petroleum hydrocarbons, VOCs, and SVOCs which may be at least partly responsible for the compounds previously detected in groundwater.

The potential for offsite sources will be assessed by installing and monitoring two shallow groundwater monitoring wells upgradient of the CNG facility and monitoring the sewer/drain that is suspected to be present under Fifth Street. At Ecology's request, a third well (MW-11) will be completed near the southern property boundary. The data obtained from Task 1 will be used to more fully evaluate local groundwater flow direction, quality, and potential upgradient sources of groundwater contaminants.

Task 2

A summary of the VOCs and SVOCs that have been detected during previous investigations at the CNG facility is shown on Table A.1. Based on SEACOR's understanding of material usage at the facility under CNG's occupancy, there is no known source of the non-petroleum related hydrocarbons that have been detected to date. Nor have there been any documented releases of petroleum products during CNG's use of the site. Some of the detected compounds are common constituents of gasoline and/or diesel fuel. These compounds include:

- Benzene;
- Toluene;
- Ethyl benzene;
- Xylenes;
- 1,2-Dichloroethane;
- Naphthalene;
- Methylnaphthalene; and
- Phenanthrene.

The presence of these compounds in soil or groundwater at a leaking petroleum UST site is not uncommon. However, the other detected VOC and SVOC compounds are not commonly associated with petroleum UST sites. Two of the detected VOCs (acetone and methylene chloride) are suspected to be laboratory artifacts which are attributable to laboratory procedures.

Bis-(2-ethylhexyl)phthalate (BEHP) is ubiquitous to our environment and is used as a plasticizer in the manufacturer of paper, styrofoam, plastics, and rubber products. According to the National Library of Medicine, Hazardous Substance Data Bank File, BEHP is used in paper and plastic food containers, insecticides/pesticides, cosmetics, liquid soap, rubbing alcohol, detergents, ink, lacquers, munitions, lubricating oils, styrofoam, PVC products, synthetic rubber products, plastic products (including utensils, cookware, boots, raincoats, baby bottles, etc.). Exposure to BEHP has been documented through PVC blood bags, packaged food and beverages, clothing, drinking water, fish, swimming pools, etc.

The ubiquity of phthalates in our environment is widely recognized, as is recognition of the widespread problem of cross-contamination in environmental samples. In a published study conducted to evaluate potential sources of cross-contamination, phthalate artifacts were detected at concentrations of 6.5 parts per million (ppm) in trip blanks, 1.3 ppm in aluminum foil (commonly used to cover sample ends), 7.4 to 9 ppm in latex sampling and laboratory gloves, 1.1 to 12 ppm in 50 percent of method blanks, 1.1 to 87.9 ppm in 80 percent of equipment blanks, and 19.4 ppm in rinse water (Sullivan, Carty, Lupo and Felkey, "Phthalates: Unreliable Indicators of Hydrocarbon Contamination in Environmental Soil and Water Analysis," Hydrocarbon Contaminated Soil and Groundwater, Volume 3, Lewis Publishers, 1993). Because phthalates are so common in sampling, health and safety, and laboratory equipment, the reported presence of low-level phthalates in an environmental sample is not necessarily representative of the actual in-situ chemical character of the environmental medium.

A review of the Site Hazard Assessment (SHA) report provided by Ecology to CNG reveals that all of the soil samples that were analyzed for SVOCs during the SHA exceeded the maximum EPA-recommended holding time of 7 days for SVOCs. Two of the soil samples that were analyzed for VOCs were held beyond the maximum EPA-recommended holding time of 14 days before analysis. In addition, one of the monitoring well groundwater samples and two of the soil samples were reported as having been received by the laboratory before the samples were actually collected at the CNG facility. The exceedances of standard sample holding times and the documentation errors regarding sample control suggest a lack of adequate quality assurance and quality control (QA/QC) at the analytical laboratory used during the SHA. As a result, the validity of the analytical data developed during Ecology's SHA is subject to question.

Final Discharge Location of the County Drain

The county drain that underlies East Decatur Avenue discharges to an open channel near the intersection of Lincoln Avenue and Fourth Street approximately 3,000 feet south of the CNG facility. This has been confirmed by the *City of Sunnyside Existing Storm Sewer Plan-General Map, November 1974.*

Discharge Location for Onsite Stormdrains

The exterior onsite drains [Stormdrain-1 and Stormdrain-2 (see Figure A.1)] and the two interior floor drains (Figure A.1) are connected to a common line which discharges to the stormdrain system at Manhole-3 near the southwest corner of the CNG site. None of the four onsite drains are drywells; therefore, CNG is not required to collect analytical soil samples from them. CNG will provide copies of maps which document the discharge locations of the County drain and onsite drains.

Clearly, there are costs to be incurred as a result of collecting and analyzing additional groundwater and/or soil samples for the full suite of VOCs and SVOCs that have been previously detected in media samples from the CNG facility. However, SEACOR believes that it is in CNG's best interest to concede to Ecology's request to analyze for VOCs and SVOCs. SEACOR recommends that the laboratory report only on those compounds that have been previously detected and that the strictest QA/QC protocols be implemented to assure generating valid data.

Sincerely,

Science & Engineering Analysis Corporation

Gordon W. Shaffer
Associate Scientist

SEACOR

EXHIBIT A

ADDENDUM
REMEDIAL INVESTIGATION AND ASSESSMENT OF GROUNDWATER REMEDIAL ALTERNATIVES

Cascade Natural Gas Corporation
512 East Decatur Avenue
Sunnyside, Washington

For

Mr. Thomas E. Lindley
Miller, Nash, Wiener, Hager & Carlsen
3500 U.S. Bancorp Tower
111 SW Fifth Avenue
Portland, OR 97204-3699

Prepared by
SEACOR

January 21, 1994

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TABLES

FIGURE

1.0 INTRODUCTION

This Work Plan addendum has been prepared pursuant to a November 3, 1993 request by the Washington State Department of Ecology (Ecology) to address the potential presence of volatile organic compounds (VOCs) and semi-volatile compounds (SVOCs) in groundwater at the Cascade Natural Gas Corporation (CNG) facility located at 512 East Decatur Avenue in Sunnyside, Washington. This addendum also provides for four additional investigative items which were requested by Ecology during a December 27, 1993 meeting at Ecology's office in Yakima, Washington. These tasks are:

- Identify the location where the county drain discharges into an open channel southwest of the CNG site;
- Identify the discharge locations of the two storm drains at the CNG facility;
- If one or both of the stormdrains are drywells, collect analytical soil samples from the bottom of the drywell(s); and
- Install and sample one groundwater monitoring well near the south boundary of the CNG facility.

This addendum also provides for further assessing groundwater flow directions, and assessing the potential for offsite and/or upgradient sources of the chemical compounds which have been identified in groundwater at and downgradient of the CNG facility. CNG has also provided information regarding the discharge location of two interior floor drains at the CNG facility.

A limited suite of VOCs and SVOCs have been detected in subsurface soil and/or groundwater samples from the CNG facility during three previous investigations (conducted by White Shield, Ecology, and SEACOR). A summary of the detected VOCs and SVOCs is shown by investigation and environmental media on Table A.1. A survey of the site identified two previously unknown manholes in Fifth Street west of the CNG facility. The manholes suggest the presence of a subsurface drain or sewer which is not shown on the utility maps currently available to CNG. If the drain or sewer exists, it may provide a conduit for petroleum hydrocarbons, VOCs, and SVOCs to migrate from unknown upgradient sources into the vicinity of the CNG facility.

The purpose of the scope of work presented in this addendum is to further assess groundwater flow direction and presence of the previously detected VOCs and SVOCs in groundwater downgradient, onsite and upgradient of the CNG facility. The suspected subsurface drain or sewer under Fifth Street will also be investigated to assess the chemical quality and direction of flow.

2.0 SCOPE OF WORK

Five tasks have been designed to meet the objectives of this addendum.

Task 1 provides for more fully assessing groundwater flow direction and the potential for offsite sources of VOCs and SVOCs that have been detected during previous investigations. Task 1 includes assessing the drain/sewer under Fifth Street, installing and sampling two groundwater monitoring wells upgradient of the CNG facility, and installing one groundwater monitoring well near the southern boundary of the CNG facility.

Task 2 provides for collecting and analyzing groundwater samples from selected onsite and downgradient monitoring wells (including the proposed well near the southern boundary) for the suite of VOCs and SVOCs that have been previously detected.

Task 3 provides for identifying the final discharge point of the County drain that underlies East Decatur Avenue.

Task 4 provides for identifying the discharge location (sanitary sewer, stormdrain, County drain, or drywell) for the two exterior onsite stormdrains and the two interior floor drains.

Task 5 provides for a contingency soil sampling and analysis program in the event that any of the stormdrains or floor drains are found to be drywells.

2.1 TASK 1 - ASSESS GROUNDWATER FLOW DIRECTION AND POTENTIAL OFFSITE SOURCES

Available City of Sunnyside, Irrigation District, and Yakima County maps of subsurface drains and sewers in the vicinity of the CNG facility will be reviewed to confirm the presence of the Fifth Street drain/sewer and known connections to it. In the event that adequate documentation is not available, then a remote video inspection or other means to trace the course of the drain/sewer may be conducted.

The elevation of water in the drain/sewer will be monitored at Manholes MH-1 and MH-2 shown on Figure A.1. Water levels will also be monitored in the County drain under Decatur Avenue, in wells MW-1 through MW-8, and in well MW-UTC-4 at the United Telephone Company facility. Samples of the Fifth Street drain/sewer water (if sufficient flow volume allows) will be collected for chemical analysis of petroleum hydrocarbons and the suite of VOCs and SVOCs presented on Table A.1. Sample collection and equipment decontamination protocols contained in the July 13, 1993 Work Plan will be utilized. Analysis for petroleum hydrocarbons will include:

- Total petroleum hydrocarbons (TPH) as gasoline (TPH-G), and
- TPH as diesel fuel (TPH-D).

Specific analytical methods for each of the VOCs, SVOCs, and petroleum hydrocarbon constituents are identified on Table A.2. All analyses will be completed by North Creek Analytical of Bothell, Washington.

Additional investigation of potential offsite sources will be completed by installing and sampling two shallow upgradient monitoring wells (MW-9 and MW-10). As shown on Figure A.1 well MW-9 will be located near the east CNG property line in the northern portion of the facility. Well MW-10 is proposed to be installed in the public right-of-way on the west side of Fifth Street approximately opposite from the north CNG property line. The wells will be completed in the uppermost saturated zone in accordance with the July 13, 1993 Work Plan protocols for well drilling, installation, development, sampling, and equipment decontamination. Groundwater and soil samples from wells MW-9 and MW-10 will also be sampled and analyzed for the suite of VOCs and SVOCs shown on Table A.1, TPH-G, and TPH-D.

One groundwater monitoring well (MW-11) will be installed near the southern CNG property boundary as shown on Figure A.1. This well is proposed to be installed in the sidewalk that occupies public right-of-way. This well will also be completed in the uppermost saturated zone. Well completion and sampling will be conducted in accordance with the July 13, 1993 Work Plan protocols for drilling, installation, development, sampling, and equipment decontamination. Water and soil samples from well MW-11 will be analyzed for the TPH-G, TPH-D, and the suite of VOCs and SVOCs shown on Table A.1 and Table A.2.

2.2 TASK 2 - ASSESS VOCs AND SVOCs IN SELECTED MONITORING WELLS

In addition to sampling and analyzing groundwater samples from wells MW-9, MW-10, and MW-11, supplemental groundwater samples will be collected from wells MW-2 (upgradient), MW-1 (cross-gradient), and MW-3 and MW-4 (downgradient) for analyses of the VOCs and SVOCs previously detected at the CNG facility (Table A.1).

Sampling and equipment decontamination protocols contained in the July 13, 1993 Work Plan will be utilized.

2.3 TASK 3 - IDENTIFY DISCHARGE POINT OF COUNTY DRAIN

Available utility maps and onsite observations have been used to identify and confirm the discharge location of the County drain that underlies East Decatur Avenue adjacent to the CNG facility. The County drain discharges to an open channel near the intersection of Lincoln Avenue and Fourth Street approximately 3,000 feet south of the CNG facility. A copy of the utility map will be provided in the investigation report.

2.4 TASK 4 - IDENTIFY DISCHARGE POINTS FOR ONSITE STORMDRAINS

Two stormdrains (Stormdrain-1 and Stormdrain-2) have been identified by Ecology and CNG on the CNG site (Figure A.1). Two interior floor drains have also been identified by CNG. These drains have been determined by CNG to discharge to the stormdrain system at Manhole-3 near the southwest corner of the CNG facility (Figure A.1). Documentation of the discharge location will be shown on the site map in the investigation report.

2.5 TASK 5 - CONTINGENCY DRYWELL SAMPLING AND ANALYSIS

Neither of the two onsite stormdrains or interior floor drains are drywells; therefore, completion of this task is not required.

3.0 REPORTING

The results Addendum Tasks 1 through 4 will be presented in the focused RI/FS report described in the July 13, 1993 Work Plan.

4.0 SCHEDULE

The field work to complete Addendum Tasks 1 through 4 can be completed within three weeks of receiving authorization. A draft Focused Remedial Investigation report will be submitted to CNG within 4 weeks of completing field activities (approximately 2 weeks after SEACOR's receipt of laboratory analytical data). A final draft report will be submitted to CNG within one week of receiving CNG comments. The final report will be submitted concurrently to Ecology and CNG within one week of CNG's receipt of the Final Draft report.

TABLE A.1
DETECTED COMPOUNDS BY MEDIA
CASCADE NATURAL GAS CORPORATION
SUNNYSIDE, WASHINGTON

	WHITE SHIELD INVESTIGATIONS		ECOLOGY INVESTIGATION		SEACOR INVESTIGATIONS	
	SOIL	GROUNDWATER	SOIL	GROUNDWATER	SOIL	GROUNDWATER
Volatile Organic Compounds						
Benzene	X	NA	X	X	X	X
Toluene	X	NA	X	ND	X	X
Ethyl Benzene	X	NA	X	ND	X	X
Xylenes	X	NA	X	ND	X	X
Acetone[1]	ND	NA	X	ND	NA	NA
Methylene Chloride[1]	ND	ND	X	ND	NA	X[3]
1,1-Dichloroethane	ND	ND	X	ND	NA	ND
1,2-Dichloroethane	ND	X	ND	ND	NA	X
1,1,1-Trichloroethane	ND	ND	X	ND	NA	ND
Semi-Volatile Organic Compounds						
Butylbenzyl phthalate	X	NA	X[2]	NA	ND	NA
Bis(2-ethylhexyl)phthalate	ND	NA	X[2]	NA	ND	NA
Di-n-octyl phthalate	ND	NA	X[2]	NA	ND	NA
Di-ethyl phthalate	ND	NA	X[2]	NA	ND	NA
Di-n-butyl phthalate	ND	NA	X[2]	NA	ND	NA
Dibenzofuran	X	NA	ND	NA	ND	NA
Naphthalene	X	NA	X[2]	NA	X	NA
2-Methylnaphthalene	X	NA	X[2]	NA	X	NA
Pentachlorophenol	X	NA	ND	NA	X	NA
Isophorone	ND	NA	ND	NA	X	NA
Phenanthrene	ND	NA	ND	NA	X	NA

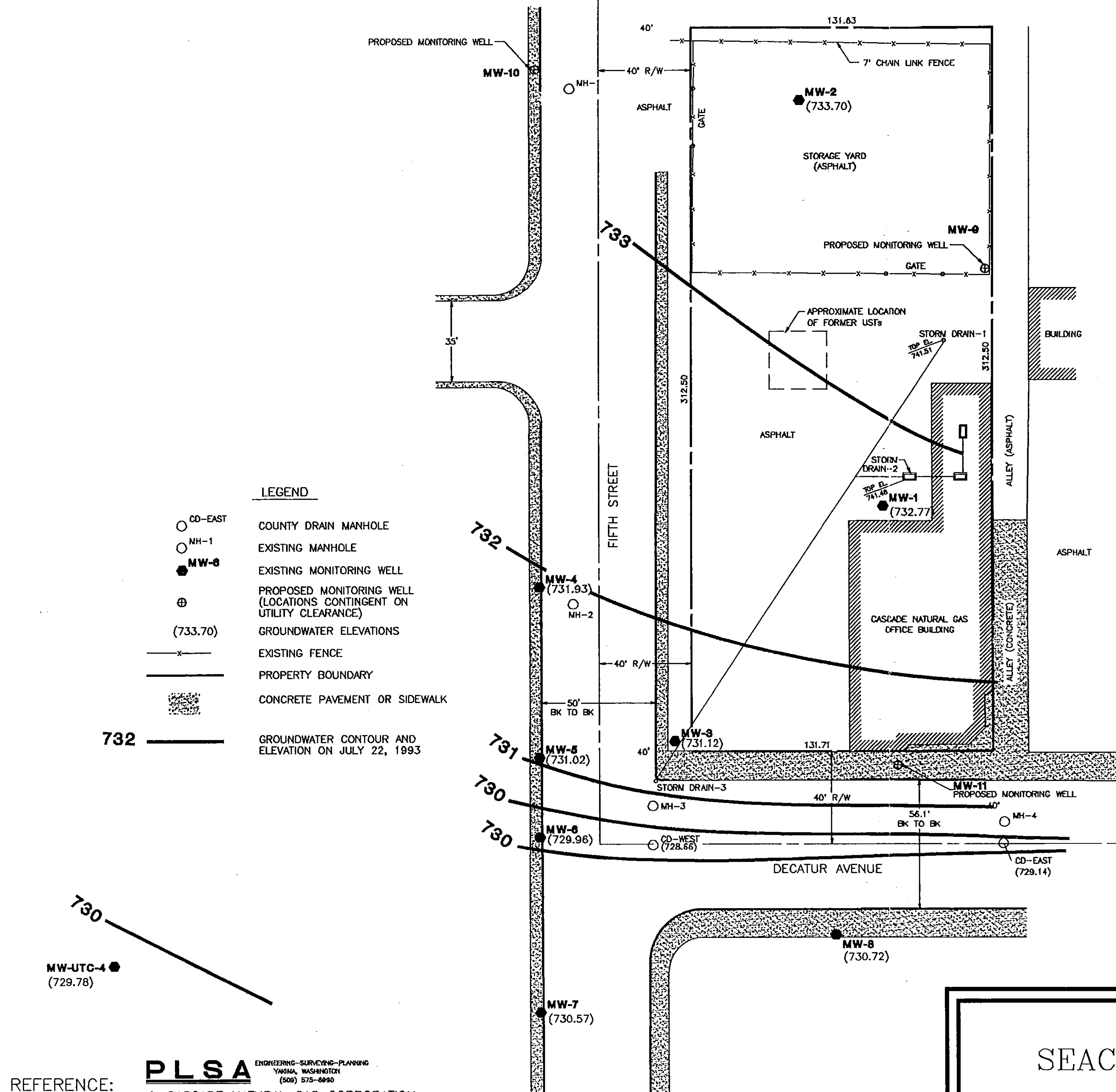
NOTES:

X = Analyte Detected.
NA = Not Analyzed.
ND = Not Detected.

1 A common laboratory contaminant.
2 Detected concentration was an estimated value which was well below the method reporting limit.
3 The laboratory reported that this is a suspected laboratory contaminant.

TABLE A.2
ANALYTICAL METHODS

	ANALYTICAL METHOD
Volatile Organic Compounds	
Benzene	EPA 8240
Toluene	EPA 8240
Ethyl Benzene	EPA 8240
Xylenes	EPA 8240
Acetone	EPA 8240
Methylene Chloride	EPA 8240
1,1-Dichloroethane	EPA 8240
1,2-Dichloroethane	EPA 8240
1,1,1-Trichloroethane	EPA 8240
Semi-Volatile Organic Compounds	
Butylbenzyl phthalate	EPA 8270
Bis(2-ethylhexyl)phthalate	EPA 8270
Di-n-octyl phthalate	EPA 8270
Di-ethyl phthalate	EPA 8270
Di-n-butyl phthalate	EPA 8270
Dibenzofuran	EPA 8270
Naphthalene	EPA 8270
2-Methylnaphthalene	EPA 8270
Pentachlorophenol	EPA 8270
Isophorone	EPA 8270
Phenanthrene	EPA 8270
Petroleum Hydrocarbons	
TPH-G	WTPH-G
TPH-D	WTPH-D



REFERENCE ELEVATIONS

FEATURE	ELEVATION	FEATURE	ELEVATION
MW-1	741.77	MH-1	741.55
MW-2	742.40	MH-2	741.29
MW-3	740.99	MH-3	741.16
MW-4	740.78	MH-4	742.05
MW-5	740.61	CD-WEST	741.46
MW-6	740.70	CD-EAST	742.22
MW-7	740.59	STORM DRAIN-1	741.51
MW-8	741.00	STORM DRAIN-2	741.48
MW-UTC-4	740.19	STORM DRAIN-3	740.48

NOTE: WELL ELEVATIONS ARE TO TOP OF PVC CASING

NOTE:
ELEVATION DATUM ESTABLISHED FROM U.S.C. & G.S. BRASS DISK IN THE NORTHEAST CORNER OF CITY HALL BUILDING HAVING AN ELEVATION OF 742.77

REFERENCE: PLSA ENGINEERING-SURVEYING-PLANNING YAKIMA, WASHINGTON (509) 575-6990
& CASCADE NATURAL GAS CORPORATION

SEACOR

DWN AJW
APPR
DATE 1/20/94
JOB# 00058-019-01

FIGURE A.1
SITE PLAN
CASCADE NATURAL GAS CORPORATION
512 EAST DECATUR AVENUE
SUNNYSIDE, WASHINGTON

DWG:CNG1904B

EXHIBIT B

January 27, 1993

TO: Persons Collecting Ground Water and Other Data at MTCA Sites

FROM: Carol Fleskes, Program Manager
Toxics Cleanup Program

SUBJECT: Cleanup Information No. 91-1: Ground Water, Soil, Sludge, and Sediment Data (Environmental Data)

Purpose

The purpose of this memorandum is to establish consistency and procedures for organizing, reporting, transmitting, and storing and retrieving surface water, ground water, soil, sludge, and sediment data (environmental data). These procedures will improve Ecology's ability to cleanup contaminated sites by making meaningful data readily available to the public, legislature, management, project managers, and site workers.

Applicability

These procedures apply to all environmental data collection activities required by the Model Toxics Control Act and Regulations. Exceptions may be made for low risk sites as determined by the Ecology project manager.

Background

Currently, very little of the environmental data collected for the state at toxic cleanup sites is available in a readily usable form. With only a few exceptions, these data are submitted to the department in the form of voluminous paper reports. This form precludes the staff from performing rapid, accurate and many times meaningful analysis of spatial and temporal trends of the data. In addition, the evaluation of environmental data cannot always be effective because of missing and/or improper pertinent information.

This procedure establishes appropriate methods to ensure that data submitted to Ecology is encoded, stored, and presented in a magnetic media format (diskette) so that data can be consistently used by our staff. This procedure will reduce data analysis time when compared to using laborious, time consuming hand methods of the past. Today, at most of the larger sites and many of the smaller sites, these data are processed using computers by the PLP's and consultants. This procedure will generally require the data be rearranged and in some cases additional data items collected.

The results of receiving digital data in a consistent manner will allow exchange of environmental date with EPA and between Ecology programs. This format is a super set of that developed by EPA. It is being used by other Ecology Programs.

Standardization of the data will mean that a broad range of computational, statistical, graphical and modeling software will be readily available to summarize and analyze the data. Standardized report will be available for the first time in the program.

Responsibilities

The attached procedures shall be required for all of the environmental data collection activities as follows:

- Directly by TCP
- By any contractors or consultants tasked by TCP
- By "potentially liable parties" acting under terms of a consent decree or order

Implementation of the procedures shall be by incorporation of the appropriate language into contracts, work plans, orders, consent decrees or other appropriate documents by the site project manager or contract officer.

Data shall be entered into the Ecology data base by a data administrator. There is an inter-program team that established new parameters. At this time, Bill Myers at headquarters is acting in this capacity and as the TCP representative to the team.

Depending on the availability of a wide area network, the data would be directly or indirectly available to staff and other data users. At this time, the Site Cleanup Section is developing links from the present data base program to other statistical, graphical and analytical software packages.

Also attached is a model letter which is sent, along with a diskette, to anyone using our format to submit environmental data. These diskettes are also available to staff. To obtain a copy call Bill at the telephone number shown on the letter.

KC:
Attachments

SITE DESCRIPTION AND SAMPLE DATA SUBMITTAL REQUIREMENTS

1. Media

Required data must be submitted on MS-DOS[1](version 5) or compatibly formatted diskettes. The diskettes may be 5 1/4 inch (or 3 1/2 inch) either: double sided, double density; or double sided, high density.

2. Data Formats

The SITE DESCRIPTION FILE, FIELD SAMPLE FILE and the LABORATORY SAMPLE FILE are quote, comma delimited ASCII files used as the standard format for transferring sample data to and from Ecology (LOTUS WK1 files and Ashton Tate DBF files may be substituted for ASCII files). The files will include the fields in the format and order listed (C-Character, N-Numeric, D-date[Character may be substituted in non DBF or WK1 format]).

The following Appendices are attached to standardize information entered into required files (see following appendices):

A. Matrix Codes

B. Sample Source Codes

C. Collection Method Codes

D. Chemical Data Dictionary (Standardizes Spelling, STORET P-codes., etc entered into the SAMPLE ANALYSIS FILE.

E. Laboratory Qualifiers

F. State Plane Zones (N or S)
(NOTE: Copy of RCW 58.20 provided for reference)

G. County Fips Codes

H. Hydrologic Unit Map

3. Submittal

Computer diskettes containing the SITE DESCRIPTION FILE, FIELD SAMPLE FILE and/or the LABORATORY SAMPLE FILE, clearly labeled for Project and Originator shall be submitted in duplicate, along with a backup hard copy of the diskette contents.

[1] Trademark of the Microsoft Corporation

FIELD DEFINITIONS FOR SITE DESCRIPTION FILE

*Wells and Borings must include all Fields except as noted optional. Underlined Fields are required for all stations.

FIELD	TYPE	WIDTH	DEFINITION
<u>REP_DATE</u>	D	10	Reporting date (mm/dd/yyyy).
<u>REP_NAME</u>	C	48	Reporting entity, data submitted by.
<u>PRJ_NAME</u>	C	48	Project, site, or facility name.
<u>STA_TYPE</u>	C	12	Station type (Ground water, Surface wtr, Sediment, Soil, Sludge, Biological or Air).
STA_USE	C	1	Well use (USGS codes) O-observation, W-water withdrawal, X-waste disposal, D-drain, T-test hole, E-geothermal, P-oil/gas, U-unused, R-recharge, Z-destroyed.
WTR_USE	C	1	Water use (USGS codes) W-water quality/level monitoring, D-dewatering, N-industrial, S-stock supply, B-bottling, I-irrigation, Q-aquaculture, U-unused, C-commercial supply, H-domestic supply P-public supply, J-industrial cooling, F-fire protection, Z-other.
DATA_REL	C	1	Data Reliability (USGS codes) C-field checked, L-poor location, U-unchecked.
<u>STA_ID</u>	C	12	Well ID number.
<u>PRI_STA</u>	C	15	Ecology primary station code. To be obtained from Ecology TCP.
SEC_STA1	C	12	Additional station code (previous well numbers, alternate or other well designations).
SEC_STA2	C	12	Additional station code (if any).
SEC_STA3	C	12	Additional station code (if any).
<u>STATE_FIPS</u>	C	2	State FIPS code (WA-53).

SITE DESCRIPTION FILE CONTINUED...

FIELD	TYPE	WIDTH	DEFINITION
COUNTYFIPS	C	3	County FIPS code (use state county code, Appendix F).
STATE_CHAR	C	2	State (WA).
COUNTYCHAR	C	16	County.
OWN_NAME	C	30	Monitoring well owner name.
OWN_DT	D	8	Date of ownership of well (mm/dd/yyyy).
OWN_ADD	C	60	Address of owner.
DRILLER	C	30	Name of Driller.
STA_DESC	C	48	Activity Site, Sample location, or Well location description (for example: "East of Bldg. 2" or "SE corner, intersection 6th & Seneca").
LOC_METHD	C	48	Method of determination of station location coordinates (Note: survey to known horizontal datum is required).
LAT	N	8	Latitude OPTIONAL (degrees-minutes-seconds-tenths).
LONG	N	9	Longitude OPTIONAL (degrees-minutes-seconds-tenths).
STPCO_NORT	N	12	Northerly state plane coordinates REQUIRED (nearest ft).
STPCO_EAST	N	12	Easterly state plane coordinates REQUIRED (nearest ft).
STPCO_ZONE	C	1	State plane coordinates: state plane zone REQUIRED (N or S).
LAND_NET	C	20	Land net location of well (Township, Range, Section, 1/4-1/4 Sec.). Use USGS 1/4-1/4 section alphabetic designator A through R OPTIONAL.

SITE DESCRIPTION FILE CONTINUED...

FIELD	TYPE	WIDTH	DEFINITION
UTM_NORTH	N	9	UTM grid system coordinates: North (meters) OPTIONAL.
UTM_EAST	N	8	UTM grid system coordinates: East (meters) OPTIONAL.
UTM_ZONE	C	2	UTM grid zone.
MAP_NAME	C	24	Name of USGS map and scale covering the sampling location(e.g., Yakima 100K, 1977).
BORE_DEP	N	8	Depth of original hole drilled if applicable (nearest 0.01 ft).
WELL_DEP	N	8	Well depth (nearest 0.01 ft).
WTR_ELEV1	N	8	Water level elevation at time of installation (nearest 0.01 ft).
WLEV_DAT1	D	10	Date of water level elevation measurement (mm/dd/yyyy).
MEAS_ELEV	N	8	Measuring point (reference point) elevation (nearest 0.01 ft).
MEAS_DESC	C	48	Measuring point description.
DATUM	C	48	Measuring point datum (The source of the altitude used to survey in the sampling location altitude i.e. City of Tacoma Sewer Survey 1921).
LEV_COMM	C	240	Comments, depth and water level data.
ALTITUDE	N	8	Approximate land surface elevation XXXXX.XX (ft) at the Station Location.
DEPTOWTR1	N	8	Water depth at time of install. (nearest 0.01 ft).
CONST_DT	D	10	Date of installation (mm/dd/yyyy).
MOREINT	C	1	More than one open interval (Y/N).

SITE DESCRIPTION FILE CONTINUED...

FIELD	TYPE	WIDTH	DEFINITION
UP_DEPTH	N	8	Depth to top of open interval (ft below measuring point).
LOW_DEPTH	N	8	Depth to bottom of open interval (ft below measuring point).
CONST_COMM	C	240	Comments, construction details.
MTD_CON	C	1	Method of construction (USGS WATSTORE codes) A-air rotary, B-bored/augured, C-cable tool, D-dug, H-hydraulic rotary, J-jetted, P-air percussion, T-trenching, V-driven, W-drive wash, R-reverse rotary, X-mud rotary, Z-other.
FILT_LEN	N	5	Length of filter pack (nearest 0.01 ft).
FILT_MAT	C	48	Type of filter pack material and size of material (e.g., Sand 200 mesh).
DIA_BOR	N	8	Boring diameter (in).
DIA_CAS	N	8	Casing diameter (in).
CAS_MAT	C	1	Casing material (USGS WATSTORE codes) B-brick, C-concrete, D-copper, F-teflon/fluorocarbon, G-galvanized iron, I-wrought iron, M-other metal, P-pvc/plastics, R-rock/stone, S-steel, T-tile, W-wood, U-coated steel, Z-other.
DIA_OPN	N	6	Diameter of open interval (in).
LEN_OPN	N	6	Length of open interval (nearest 0.01 ft).
TYP_OPN	C	1	Type of open interval (USGS WATSTORE codes) P-perforated/slotted screen, L-louvered/shuttered screen, S-screen (unknown type), F-fracture, R-wire wound, M-mesh, T-sand point, W-walled, X-open hole, Z-other.

SITE DESCRIPTION FILE CONTINUED...

FIELD	TYPE	WIDTH	DEFINITION
TYP_OMT	C	1	Material type, open interval (USGS WATSTORE codes) R-stainless steel, F-teflon/fluorocarbon, G-galvanized iron, P-pvc/plastic, B-brass/bronze, W-wrought iron, S-steel, T-tile, C-concrete, M-other metal, Z-other.
INT_COMM	C	240	Comments, open interval.
LOG_AVAIL	C	1	Well log data available? (Y/N).
TYP_LOG	C	10	Type of well log (USGS WATSTORE codes) A-time, B-collar, C-caliper,D-driller, E-electric, F-fluid conduction, G-geologist, H-magnetic, I-induction, J-gamma ray, K-dip meter, L-lateral log, M-microlog, N-neutron, O-microlateral log, P-photo/video, Q-radioactive, S-sonic, T-temperature, U-gamma gamma, V-fluid velocity, X-core, Z-other.
LOG_DOC	C	240	Log data source documents (e.g. Remedial Investigation Report).
OTHER_DOC	C	240	Other data source documents.
LOG_LOC	C	60	Location of well log (e.g. Ecology Southwest Regional Office).
AQUI_TEST	C	1	Aquifer testing performed (Y/N).
PUMP_DATA	C	240	Pump data such as: Type, Manufacturer, Horsepower, and depth set .
ANDAT_AVAL	C	1	Analytical or Statistical data available (Y/N).
PROGRAM	C	9	Ecology program (TCP, WQFA, WQ, other).
GEN_COMM	C	240	General comments.
HUCODE	C	8	See US Geological Survey Hydrologic Unit Map 1974-Washington.
AGN_USE	C	1	Agency use (USGS codes) A-Active, I-inactive, O-inventory only.

** END OF SITE DESCRIPTION FILE ***

FIELD DEFINITIONS FOR
FIELD SAMPLE FILE

*All Fields Required

FIELD	TYPE	WIDTH	DEFINITION
PRI_STA	C	15	Ecology Monitoring Well No. will be assigned by Ecology TCP Program.
STA_ID	C	12	Site well ID no. or other designation.
X_LOCATION Y_LOCATION	C C	12 12	Surveyed coordinates reported in the State Plane Coordinates (to the nearest foot).
STPLNZONE	C	1	N - North; S - South.
LO_DAT_U	C	5	Year of Reference datum either 1929 or 1983 and which system L Lat Long or S for State Plane Coordinate System.
LOC_DATUM	C	48	Reference datum from Map or survey e.g., 1983 North American Datum (see Appendix F, RCW 58.20)
DEPT_WATER	N	8	Depth to water (in 0.01 ft) at time of sampling.
UP_DEPTH	N	7	Depth (nearest 0.01 ft) to the top of the interval sampled (e.g. Top of well screen or core interval).
LOW_DEPTH	N	7	Depth (nearest 0.01 ft) to the bottom of the interval sampled (e.g. Bottom of well screen or core interval).
WTR_ELEV	N	8	Water level elevation (in 0.01 ft) at the time of sampling.
AGENCY	C	8	Agency requesting sampling data.
SAMPLE_DAT	D	8	Date of well sampling (mm/dd/yyyy).
SAMP_TIME	C	4	Time of well sampling in military time.
SAMPLE_ID	C	8	Sample ID code or no.

FIELD SAMPLE FILE CONTINUED:

FIELD	TYPE	WIDTH	DEFINITION
FILTERED Yes(Y) or	L	1	Was the sample field filtered? No(N)
ANALYSIS_MTHOD	C	15	EPA Analysis method descriptions (i.e EPA Method 601).
MEAS_ELEV	N	8	Surveyed elevation of the measuring point used to determine water level depths and elevations. (nearest 0.01 ft).
MEAS_DESC	C	48	Description of the well measuring point used (e.g., top of casing, file mark on casing, etc.).
DATUM	C	48	Vertical datum used to reference elevations (e.g., MSL and source/date of information).
MATRIX	C	2	Type of sample; water, sediment, soil, other (from Appendix A).
SOURCE_COD	C	2	Physical environment sampled (from Appendix B).
COLLECTMET	C	2	Collection method code (from Appendix C).
FIELD_PH	N	5	The pH value taken at time of sampling (e.g. 11.67)
FIELD_COND	N	7	The conductivity value in umhos.
FIELD_TEMP in	N	5	The field temperature of the sample degrees celsius.
PURGE_METH	C	1	Purging method: B - Bail, P- Pump
PURGE_VOL	C	2	Number of boring volumes removed prior to sampling (liquid).
PRJ_NAME	C	48	Project, site, or facility name.

** END OF FIELD SAMPLE FILE ***

FIELD DEFINITIONS FOR LABORATORY SAMPLE FILE

*All Fields Required

FIELD	TYPE	WIDTH	DEFINITION
PRI_STA	C	15	Ecology Monitoring Well No. will be assigned by Ecology TCP Program.
STA_ID	C	12	Site well ID no. or other designation.
SAMPLE_DAT	D	8	Date of well sampling (mm/dd/yyyy).
ANALYZ_DAT	D	8	Date the sample was analyzed (mm/dd/yyyy).
SAMPLE_ID	C	8	Sample ID code or no.
LAB_NAME	C	10	Laboratory performing analysis.
LABSAMP_ID	C	10	Sample number assigned by the laboratory.
CONSTITUEN	C	30	Chemical constituent names as defined in Ecology's Chemical Dictionary (see attached Appendix D)
CAS_ID	C	12	Chemical Abstract Systems ID (see Appendix D).
P_CODE	C	5	STORET Parameter Code (see Appendix D).
RESULT	N	12	Detected chemical concentration result.
UNITS	C	10	Units of measurement (e.g., µg/Kg).
QUAL	C	4	Contract Laboratory Program chemical data qualifiers (such as U, J, R, UJ, etc.). Non-Contract Lab Program qualifiers, such as less-than signs ("<") orasterisks, are not acceptable (see Appendix E).
QA_QUAL	C	4	Qualifier associated with QA Review of Lab report (See Appendix E).
LIMIT	C	10	Lab instrument detection limit.

LABORATORY SAMPLE FILE CONTINUED:

FIELD	TYPE	WIDTH	DEFINITION
DILUTION	N	6	Amount the sample was reduced and diluted to accommodate analysis (i.e. 10X,20X).
FILTERED	L	1	Was the sample lab filtered? Yes(Y) or No(N)
ANALYSIS_MTHOD	C	15	EPA Analysis method descriptions (i.e EPA Method 601).
MATRIX	C	2	Type of sample; water, sediment, soil, other (from Appendix A).
PRJ_NAME	C	48	Project, site, or facility name.

** END OF LABORATORY SAMPLE FILE ***

APPENDIX A: MATRIX CODES

10	Water-Total
11	Water-Dissolved
40	Sediment/Soil
45	Semi-Solid/Sludge
70	Sediment for EP Toxicity
80	Oil/Solvent
00	Other

APPENDIX B: SAMPLE SOURCE CODES AND DESCRIPTIONS

00	Unspecified source
01	Unknown liquid media (drum/tank)
02	Unknown liquid media (spill area)
03	Unknown liquid media (waste pond)
10	Water (general)
12	Ambient stream/river
13	Lake/reservoir
14	Estuary/ocean
15	Spring/seepage
16	Rain
17	Surface runoff/pond (general)
18	Irrigation canal/return flow
20	Well (general)
21	Well (industrial/agricultural)
22	Well (drinking water supply)
23	Well (test/observation/monitoring)
24	Drinking water intake
25	Drinking water (at tap)
30	Effluent wastewater (general)
31	Municipal effluent
32	Municipal inplant waters
33	Sewage runoff/leachate
34	Industrial effluent
35	Industrial inplant waters
36	Industrial surface runoff/pond
37	Industrial waste pond
38	Landfill runoff/pond/leachate
40	Sediment (general)
42	Bottom sediment of deposit
44	Sludge (general)
45	Sludge (waste pond)
46	Sludge (drum/tank)
48	Soil (general)
49	Soil (spill/contaminated area)
50	Bore hole material

Sample Source Codes and Descriptions
(continued)

60	Air (general)
61	Ambient air
62	Source of effluent air
63	Industrial or workroom air
64	Hi-vol filter
70	Tissue (general)
71	Fish tissue
72	Shellfish tissue
73	Bird tissue
74	Mammal tissue
75	Macroinvertebrate
76	Algae
77	Periphyton
78	Plant/vegetation
80	Oil/solvent (general)
81	Oil (transformer/capacitor)
82	Oil/solvent (drum/tank)
83	Oil/solvent (spill area)
84	Oil/solvent (waste pond)
90	Commercial product formulation
95	Well drill water
96	Well drill mud
97	Well sealing material
98	Gravel pack material

APPENDIX C: COLLECTION METHOD CODES

00	Unknown
10	Hand grab
11	Plastic bucket
12	Stainless steel bucket
13	Brass kemmerer
14	PVC kemmerer
15	D.O. dunker
16	DH 48/DH 49 Integrating sampler
17	Van Dorn bottle
18	Glass dip tube
19	Other
20	Automatic sampler (general)
21	ISCO auto sampler
22	Manning auto sampler
23	Hydrostar or similar pump
24	Submersible pump (electric)
25	Well point sampler (pump)
26	Stainless steel bailer (hand)
27	PVC bailer
28	Teflon bailer
29	Peristaltic pump
30	Dredge (unspecified)
31	Dredge (Peterson)
32	Dredge (Van Dorn)
33	Dredge (Van Veen)
34	Core
35	Freeze core
36	Bladder Pump
40	Macroinvertebrate (unspecified)
41	Picked by hand
42	Kick net
43	Surber
44	Modified Hess type sampler
45	Rock basket
46	Hester Dendy sampler
50	Fish (unspecified)
51	Fish (shocking)
52	Fish (netting)
53	Fish (hook & line)
54	Fish (poison)
60	Periphyton (unspecified)
61	Rock scraping
62	Glass slides

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
1,1,1,2-Tetrachloroethane	527.00	77562	630206	µg/L
1,1,1-Trichloroethane	1.00	34506	71556	µg/L
1,1,2,2-Tetrachloroethane	2.00	34516	79345	µg/L
1,1,2,2-Tetrachloroethene	75.05	34475	127184	µg/L
1,1,2-Trichloro2,2,1trifluoroethane	3.00	77652	76131	µg/L
1,1,2-Trichloroethane	4.00	34511	79005	µg/L
1,1-Dichloroethane	5.00	34496	75343	µg/L
1,1-Dichloroethene	6.00	34501	75354	µg/L
1,1-Dichloroethylene	6.01	34501	75354	µg/L
1,1-Dichloropropene	546.00	77168	563586	µg/L
1,2,3-Trichlorobenzene	534.00	77613	87616	µg/L
1,2,3-Trichloropropane	441.00	81610	96184	µg/L
1,2,3-Trinitrobenzene	85.00	73275	99354	µg/Kg
1,2,4-Trichlorobenzene	7.00	34551	120821	µg/L
1,2,4-Trimethylbenzene	536.00	77222	95636	µg/L
1,2,4-Trinitrobenzene	100.00			
1,2-Dibromoethane (EDB)	8.00	77651	106934	µg/L
1,2-Dichlorobenzene	9.00	34536	95501	µg/L
1,2-Dichloroethane	10.00	34531	107062	µg/L
1,2-Dichloromethane	68.01	34423	75092	µg/L
1,2-Dichloropropane	11.00	34541	78875	µg/L
1,2-Diethoxyethane	482.00	81527	629141	µg/L
1,2-Diethylbenzene	548.00	77340	135013	µg/L
1,2-Dimethylbenzene	77.02	77135	95476	µg/L
1,2-Dimethylhydrazine	582.00	73562	540738	µg/L
1,2-Diphenylhydrazine	84.00	34346	122667	µg/L
1,3,5-Trimethylbenzene	541.00	77226	108678	µg/L
1,3,5-Trinitrobenzene	156.00	73275	99354	µg/Kg
1,3-Dichlorobenzene	12.00	34566	541731	µg/L
1,3-Dichloropropene	544.00	34561	542756	µg/L
1,3-Diethylbenzene	549.00	77348	141935	µg/L
1,3-Dimethylbenzene	67.01	77134	108383	µg/L
1,4-Dichlorobenzene	13.00	34571	106467	µg/L
1,4-Diethylbenzene	550.00	77345	105055	µg/L
1,4-Dimethylbenzene	475.03	77133	106423	µg/L
1,4-Dioxane	583.00	82388	123911	mg/L
1-Methylethyl ester carbamic acid	574.00	73615	615532	µg/L
1-Methylnapthalene	211.00	77418	90120	µg/L
2 Methoxy-5-nitroaniline	584.00	73622	99558	µg/L
2 Methylaniline	585.00	77142	95534	µg/L
2 Methylaniline hydrochloride	586.00	73649	636215	µg/L
2,2,4-Trimethylpentane	545.00		5408401	
2,2-Dichloropropane	547.00	77170	594207	µg/L
2,3,4,5-Tetrachloropheno	1553.00	77767	4901513	µg/L
2,3,6-Trichloro benzeneacetic acid	575.00	85347		
2,3,7,8-TCDD	87.02	34675	1746016	µg/L

APPENDIX D: CHEMICAL DICTIONARY
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COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
2,3,7,8-Tetrachlorodibenzo-p-dioxin	87.00	34675	1746016	μg/L
2,3-Dichloropropylene	88.00	77168	78886	μg/L
2,4,5-T Methyl Ester	89.00	39740	93765	μg/L
2,4,5-TB	554.00	82650	93801	μg/Kg
2,4,5-TP (Silvex)	91.00	39760	93721	μg/L
2,4,5-TP Methyl Ester	90.00			
2,4,5-Trichlorophenol	14.00	77687	95954	μg/L
2,4,5-Trichlorophenoxyacetic acid	319.00	39740	93765	μg/L
2,4,6-Trichlorophenol	15.00	34621	88062	μg/L
2,4,6-Trimethyl-1-1,3,5-Trioxane	92.00	77322	123637	μg/L
2,4-D	93.00	39730	94757	μg/L
2,4-D Methyl Ester	93.01	39730	94757	μg/L
2,4-DB (Water, Total)	555.00	38745	94826	μg/L
2,4-Dichlorophenol	16.00	34601	120832	μg/L
2,4-Dichlorophenoxy butyric acid	235.00		94826	μg/L
2,4-Dimethylphenol	17.00	34606	105679	μg/L
2,4-Dinitrophenol	18.00	34616	51285	μg/L
2,4-Dinitrotoluene	19.00	34611	121142	μg/L
2,4-Toluenediamine	587.00	78888	95807	μg/L
2,5-Dinitrotoluene	94.00	77637	619158	μg/L
2,6-Dinitrotoluene	20.00	34626	606202	μg/L
2-Butanone	376.03	81595	78933	μg/L
2-Chloroethyl vinyl ether	22.00	34576	110758	μg/L
2-Chloronaphthalene	23.00	34581	91587	μg/L
2-Chlorophenol	24.00	34586	95578	μg/L
2-Chlorotoluene	535.00	38680	95498	μg/L
2-Cyclohexene-1-one	488.00	930697		
2-Ethyl hexanoic acid	196.00	82114	149575	μg/L
2-Hexanone	25.00	77103	591786	μg/L
2-Methyl-2H-benzotriazole	576.00	85813	29385431	μg/L
2-Methyl-4,6-dinitrophenol	96.00	34657	534521	μg/L
2-Methyl-4-chlorophenoxyacetic acid	367.02	39151	94746	μg/L
2-Methyl-4-pentanone	95.00	78133	108101	μg/L
2-Methyl-p-cresol	17.01	34606	105679	μg/L
2-Methylnaphthalene	26.00	77416	91576	μg/L
2-Methylphenol	27.00	77152	95487	μg/L
2-Nitroaniline	28.00	30195	88744	μg/L
2-Nitrophenol	29.00	34591	88755	μg/L
2-Pentanone	97.00	77060	107879	μg/L
2-chloro-1-hydroxybenzene	24.02	34586	95978	μg/L
3,3'-Dichlorobenzidine	98.00	34631	91941	μg/L
3,3-Dimethoxybenzidine	588.00		199904	μg/L
3,3-Dimethylbenzidine	589.00	73560	119937	μg/L
3,4-Benzofluoranthene	99.00	34230	205992	μg/L
3,4-Dichlorobenzyl N-methylcarbama+	571.00		1966581	μg/L
3,5-Dichlorobenzoic acid	240.00		51365	μg/L
3-Chloro octane	528.00			

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
3-Nitroaniline	30.00	78300	99092	µg/L
4,4'-DDD	208.01	39360	72548	µg/L
4,4'-DDE	209.01	39365	72559	µg/L
4,4'-DDT	210.01	39370	50293	µg/L
4,4-Methylene bis(n,n-dimethyl) an +	592.00	101611		µg/L
4,6-Dinitro-2-methylphenol	96.01	34657	534521	µg/L
4,6-Dinitrophenol	101.00	82228	88857	µg/L
4,7-Methanoisobenzofuran-1(3H) -one +	570.00			µg/L
4-Bromophenoxybenzene	102.00			
4-Bromophenyl phenyl ether	103.00	34636	101553	µg/L
4-Chloro-2-methyl analine hydrochl +	590.00		3165933	µg/L
4-Chloro-2-methyl aniline	591.00		95692	µg/L
4-Chloro-3-methylphenol	31.00	34452	59507	µg/L
4-Chloro-m-cresol	31.01	34452	59507	µg/L
4-Chloroaniline	464.00	78303	106478	mg/Kg
4-Chlorophenyl phenyl ether	33.00	34641	7005723	µg/L
4-Chlorotoluene	540.00	77277	106434	µg/L
4-Methyl-2-pentanone	34.00	78133	108101	µg/L
4-Methyl-o-cresol	17.02	34606	105679	µg/L
4-Methylphenol	35.00	77146	106445	µg/L
4-Nitroaniline	36.00	73278	100016	µg/Kg
4-Nitrophenol	37.00	34646	100027	µg/L
5-Bromopyrimidine	104.00			
5-Hydroxy Dicamba	256.00			µg/L
AAtrex	281.01	39033	1912249	µg/L
Acenaphthene	38.00	34205	83329	µg/L
Acenaphthylene	39.00	34200	208968	µg/L
Acephate	385.02	81815	30560191	µg/L
Acetone	40.00	81552	67641	µg/L
Acifluorfen	215.00	79193	6247659	µg/L
Acrolein	105.00	34210	107028	µg/L
Acrylamide	593.00	38576	79061	µg/L
Acrylonitrile	106.00	34215	107131	µg/L
Alachlor	273.00	77825	15972608	µg/L
Alanex	273.01	77825	15972608	µg/L
Aldicarb	274.00	39053	116063	µg/L
Aldicarb sulfone	320.00	82587	1646884	µg/L
Aldicarb sulfoxide	318.00	82586	1646873	µg/L
Aldrin	107.00	39330	309002	µg/L
Alkalinity as CaCO3, Total	453.00	00410	471341	mg/L
Alkalinity, Total (CaCO3)	246.00	00410	471341	mg/l
Alpha Particle Activity, gross	611.00	01519	12587461	pCi/L
Aluminum, Dissolved	511.00	01106	7429905	µg/L
Aluminum, Total	510.00	01105	7429905	µg/L
Aluminum, Total Recoverable	108.00	01104	7429905	µg/L

APPENDIX D: CHEMICAL DICTIONARY
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COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Ametryn	275.00	82184	834128	µg/L
Amiben	276.00	82051	133904	µg/L
Aminocarb	277.00	38404	2032599	µg/L
Aminotriazole	278.00	73509	61825	µg/L
Amitrole	278.01	73509	61825	µg/L
Ammonia-N, Total as-N	109.00	00610	17778880	mg/L
Aniline	110.00	77089	62533	µg/L
Anion Balance	111.00			
Anthracene	112.00	34220	120127	µg/L
Antimony, Dissolved	524.00	01095	7440360	µg/L
Antimony, Total	113.00	01097	7440360	µg/L
Antimony, Total Recoverable	21.00	01268	7440360	µg/L
Aqualin	105.01	34210	107028	µg/L
Aramite	594.00		140578	µg/L
Aroclor 1016	114.00	34671	12674112	µg/L
Aroclor 1221	115.00	39488	1104282	µg/L
Aroclor 1232	116.00	39492	11141165	µg/L
Aroclor 1242	117.00	39496	53469219	µg/L
Aroclor 1248	118.00	39500	12672296	µg/L
Aroclor 1254	119.00	39504	11097691	µg/L
Aroclor 1260	120.00	39508	11096825	µg/L
Arsenic, Dissolved	322.00	01000	7440382	µg/L
Arsenic, Inorganic (dissolved)	121.00	01000	7440382	µg/L
Arsenic, Total	137.00	01002	7440382	µg/L
Arsenic, Total Recoverable	122.00	00978	7440382	µg/L
Asbestos	123.00	34225	1332214	µg/L
Atraton	280.00	82185	1610179	µg/L
Atrazine	281.00	39033	1912249	µg/L
Avadex	532.00	73386	2303164	mg/Kg
Avenge	330.01	78882	43222486	µg/L
Azinphos-Ethyl	282.00	81292	2642719	µg/L
Azinphos-Methyl (Guthion)	359.01	39580	86500	µg/L
Azobenzene	595.00	77625	103333	µg/L
Azodrin	383.01	81890	6923224	µg/L
BFB	459.00			%
BHC	132.00	81283	608731	µg/L
BOD	499.01	00310		mg/L
Balan	283.00	39002	1861401	µg/L
Banvel	284.00	82052	1918009	µg/L
Barium, Dissolved	508.00	01005	7440393	µg/L
Barium, Total	509.00	01007	7440393	µg/L
Barium, Total Recoverable	124.00	01009	7440393	µg/L
Basagran	286.01	38710	25057890	µg/L
Basalin	354.01	79194	3324539	µg/L
Basanite	337.01	81287	88857	µg/L
Baygon	424.01	38537	114261	µg/L
Baymix	307.02	81293	56724	µg/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Baytex	351.01	38685	55389	µg/L
Benefin	283.01	39002	1861401	µg/L
Benfluralin	283.02	39002	1861401	µg/L
Benlate	285.01	38705	17804352	µg/L
Benomyl	285.00	38705	17804352	µg/L
Bensulide	288.01	82197	741582	µg/L
Bentazon	286.00	38710	25057890	µg/L
Benz(a)anthracene	130.01	34526	56553	µg/L
Benzene	41.00	34030	71432	µg/L
Benzene, 1-chloro-4-(methylsulfony+	572.00			
Benzidine	125.00	39120	92875	µg/L
Benzo(a)anthracene	130.00	34526	56553	µg/L
Benzo(a)pyrene	126.00	34247	50328	µg/L
Benzo(b)fluoranthene	127.00	34230	205992	µg/L
Benzo(b/k)fluoranthene	531.00	34242	207089	µg/L
Benzo(g,h,i)perylene	128.00	34521	191242	µg/L
Benzo(ghi)perylene	128.01	34521	191242	µg/L
Benzo(k)fluoranthene	129.00	34242	207089	µg/L
Benzoic acid	42.00	77247	65850	µg/L
Benzol	41.01	34030	71432	µg/L
Benzotrichloride	596.00		98077	µg/L
Benzyl alcohol	43.00	77147	100516	µg/L
Benzyl chloride	597.00	73520	100447	µg/L
Beryllium, Dissolved	515.00	01010	7440417	µg/L
Beryllium, Total	514.00	01012	7440417	µg/L
Beryllium, Total Recoverable	131.00	00998	7440417	µg/L
Beta Particle Activity, gross	612.00	85817	12587472	pCi/L
Betasan	288.00	82197	741582	µg/L
Bicarbonate as CaCO3	454.00	00425	471341	mg/L
Bicarbonate as HCO3	133.00	00440	71523	mg/L
Bidrin	328.01	38454	141662	µg/L
Bifenox	382.01	78883	42576023	µg/L
Biochemical Oxygen Demand	499.00	00310		mg/L
Bis(2-chloroethoxy)methane	44.00	34278	111911	µg/L
Bis(2-chloroethyl)ether	45.00	34273	111444	µg/L
Bis(2-chloroisopropyl)ether	46.00	34283	108601	µg/L
Bis(2-ethylhexyl) ester hexanediol+	577.00	103321		
Bis(2-ethylhexyl)phthalate	140.00	39100	117817	µg/L
Bis(chloromethyl)ether	598.00	34268	542881	µg/L
Bis(n-octyl)phthalate	465.01	34596	117840	µg/L
Boron	134.00	01020	7440428	µg/L
Bravo	313.02	70314	1897456	µg/L
Bromacil	289.00	82198	314409	µg/L
Bromex	386.01	38855	300765	µg/L
Bromide(dissolved)	135.00	82298	24959679	µg/L
Bromobenzene	542.00	81555	108861	µg/L

APPENDIX D: CHEMICAL DICTIONARY
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COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Bromochloromethane	533.00	32105	124481	µg/L
Bromodichloromethane	47.00	32101	75274	µg/L
Bromoform	48.00	32104	75252	µg/L
Bromomethane	49.00	34413	74839	µg/L
Bromoxynil (Water, Whole)	556.00	70979	1689845	µg/L
Butachlor, Water/Whole/Recoverable	633.00	30235	23184669	µg/L
Butanone	376.02	81595	78933	µg/L
Butyl benzyl phthalate	136.00	34292	85687	µg/L
Butylate	290.00	81410	2008415	µg/L
Butylbenzenes, Total	292.01	45049		µg/L
C3-Alkylbenzenes, Total	291.00	45046		µg/L
C4-Alkylbenzenes, Total	292.00	45049		µg/L
CEC	161.01	81356		meq/100G
CIPC	305.01	81322	101213	µg/L
COD	492.01	81319		mg/L
Cadmium, Dissolved	406.00	01025	7440439	µg/L
Cadmium, Total	407.00	01027	7440439	µg/L
Cadmium, Total Recoverable	138.00	01113	7440439	µg/L
Calcium	521.00	00910	7440702	mg/L as CaCO3
Calcium, Dissolved	520.00	00915	7440702	mg/L
Calcium, Total	141.00	00916	7440702	mg/L
Camphor (ACN)	287.00	81324	76222	µg/L
Captan	293.00	39640	133062	µg/L
Carbaryl	294.00	77700	63252	µg/L
Carbazole	329.00	77571	86748	µg/L
Carbendazim	295.00	38735	10605217	µg/L
Carbofuran	296.00	81405	1563662	µg/L
Carbon disulfide	50.00	77041	75150	µg/L
Carbon tetrachloride	51.00	32102	56235	µg/L
Carbon, Total Organic	250.00	00680	7440440	µg/L
Carbonate as CO3	142.00	00445	3812326	mg/L
Carbonate as CaCO3	455.00	00430	471341	mg/L
Carbophenothion	297.00	39786	786196	µg/L
Carboxin	139.00	70987	5234684	µg/L
Cation Balance	143.00			
Cation Exchange Capacity	161.00	81356		meq/100G
Chemical Oxygen Demand	492.00	81319		mg/L
Chloramben	276.01	82051	133904	µg/L
Chlordane	144.00	39350	57749	µg/L
Chlordecon	298.00	81281	143500	µg/L
Chlordimeform	299.00	77953	6164983	µg/L
Chloride, Total	145.00	00940	16887006	mg/L
Chlorine, Total Residual	146.00	50060	7782505	mg/L
Chlorobenzene	52.00	34301	108907	µg/L
Chlorobenzilate	300.00	39460	510156	µg/L
Chlorocyclohexane	86.00	77217	542187	µg/L
Chlorodibromomethane	58.01	32105	124481	µg/L
Chloroethane	53.00	34311	75003	µg/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Chloroethene	82.03	39175	75014	µg/L
Chloroethylene	82.02	39175	75014	µg/L
Chloroform	54.00	32106	67663	µg/L
Chloromethane	55.00	34418	74873	µg/L
Chloroneb	301.00	38423	2675776	µg/L
Chloropicrin	303.00	77548	76062	µg/L
Chloropropham	305.00	81322	101213	µg/L
Chloropropylate	302.00	38429	5836102	µg/L
Chlorothalonil	313.01	70314	1897456	µg/L
Chlorpyrifos	304.00	77969	2921882	µg/L
Chlorthal	314.02	39770	1861321	µg/L
Chromium VI	506.01	01032	18540299	µg/L
Chromium, Dissolved	516.00	01030	7440473	µg/L
Chromium, Hexavalent	506.00	01032	18540299	µg/L
Chromium, Total	491.00	01034	7440473	µg/L
Chromium, Total Recoverable	147.00	01118	7440473	µg/L
Chrysene	148.00	34320	218019	µg/L
Cinnamene	74.03	77128	100425	µg/L
Ciodrin	306.00	82565	7700176	µg/L
Co-Ral	307.01	81293	56724	µg/L
Cobalt	149.00	01037	7440484	µg/L
Coliform, Fecal	505.01	31616		#/100ml
Coliform, Total	150.00	31628		#/100ml
Color	599.00		00080	std. units
Conductivity	449.02		00094	µmhos/cm
Copper, Dissolved	408.00	01040	7440508	µg/L
Copper, Total	442.00	01042	7440508	µg/L
Copper, Total Recoverable	152.00	01119	7440508	µg/L
Corrosivity	600.00			std. units
Coumaphos	307.00	81293	56724	µg/L
Creosote	308.00	39140	8801589	µg/L
Crotoxyphos	306.01	82565	7700176	µg/L
Cumene	309.00	77223	98828	µg/L
Cyanazine	310.00	81757	21725462	µg/L
Cyanide	153.00	78248	57125	µg/L
Cyanide, Dissolved Std Method	279.00	00723	57125	µg/L
Cycloate	311.00	81892	1134232	µg/L
Cyclohexane	254.00	81570	110827	µg/L
D-D Mix	441.01	81610	96184	µg/L
DBCP	315.00	38761	96128	µg/L
DCNA	316.00	38447	99309	µg/L
DCOD	168.01	80116		mg/L
DCPA	314.01	39770	1861321	µg/L
DDD	208.00	39360	72548	µg/L
DDE	209.00	39365	72559	µg/L
DDT	210.00	39370	50293	µg/L
DDVP	317.00	73071	62737	µg/L

APPENDIX D: CHEMICAL DICTIONARY
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COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
DEF	324.00	81295	78488	µg/L
DMPA	336.00	81285	299854	µg/L
DNBP	337.00	81287	88857	µg/L
DNOC	338.00	34657	534521	µg/L
DO	169.01	00299	7782447	mg/L
Daconil	313.00	70314	1897456	µg/L
Dacthal	314.00	39770	1861321	µg/L
Dalapon	312.00	38432	75990	µg/L
Dasanit	350.01	38684	115902	µg/L
Demeton	325.00	39560	8065483	µg/L
Devrinol	387.01	79195	1529999	µg/L
Di-n-butylphthalate	155.00	39110	84742	µg/L
Di-n-octylphthalate	465.00	34596	117840	µg/L
Diallate	532.01	73386	2303164	mg/Kg
Diazinon	158.00	39570	333415	µg/L
Dibenz(a,h)anthracene	159.01	34556	53703	µg/L
Dibenz(a,h)anthracene-d	14557.00	79040	53703	mg/Kg
Dibenzo(a,h)anthracene	159.00	34556	53703	µg/L
Dibenzofuran	57.00	81302	132649	µg/L
Dibromochloromethane	58.00	32105	124481	µg/L
Dibromochloropropane	315.01	38761	96128	µg/L
Dibromodichloromethane	489.00	77779	594183	µg/L
Dibromomethane	160.00	81522	106934	µg/L
Dicamba	284.01	82052	1918009	µg/L
Dichloran	316.01	38447	99309	µg/L
Dichlorobromomethane	47.01	32101	75274	µg/L
Dichlorodifluoromethane	162.00	34668	75718	µg/L
Dichloromethane	68.02	34423	75092	µg/L
Dichloroprop	244.00	30190	120365	µg/L
Dichlorvos (DDVP)	317.01	73071	62737	µg/L
Dicofol	327.00	39780	115322	µg/L
Dicrotophos	328.00	38454	141662	µg/L
Dicyclopropyl methanone	579.00			µg/L
Dieldrin	164.00	39380	60571	µg/L
Diesel	472.00	78939	68476346	µg/L
Diethyl ether	165.00	81576	60297	µg/L
Diethylphthalate	59.00	34336	84662	µg/L
Diethylphthalate-d4	558.00			
Difenson	397.01	39022	80331	µg/L
Difenzoquat	330.00	78882	43222486	µg/L
Diisopropyl ether	154.00	81577	108203	µg/L
Dimecron	414.01	78881	13171216	µg/L
Dimethoate	331.00	46314	60515	µg/L
Dimethyl ketone	40.02	81552	67641	µg/L
Dimethyldisulfide	166.00	81580	624920	µg/L
Dimethylphthalate	60.00	34341	131113	µg/L
Dimethyltetrachlorophthalate	314.03	39770	1861321	µg/L
Dinitro-o-cresol	338.01	34657	534521	µg/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Dinoseb	337.02	81287	88857	µg/L
Dioxathion	332.00	38783	78342	µg/L
Dioxin	87.01	34675	1746016	µg/L
Diphenamide	333.00	78004	957517	µg/L
Diphenoloxide	167.00	77587	101848	µg/L
Diquat	334.00	78885	85007	µg/L
Direct Black 38	601.00			µg/L
Direct Blue 6	602.00		2602462	µg/L
Direct Brown 95	603.00		16071866	µg/L
Dissolved COD	168.00		80116	mg/L
Dissolved Oxygen	169.00	00299	7782447	mg/L
Dissolved TOC	170.00	00679	7440440	kg/100GAL
Disufoton sulfone	642.00			µg/L
Disulfoton (Di-Syston)	171.00	81888	298044	µg/L
Disulfoton sulfoxide	643.01	81030	2497076	µg/L
Dithane	365.01	38831	8018017	µg/L
Dithiocarbamate	446.01	38917	137304	µg/L
Diuron	335.00	39650	330541	µg/L
Dowpon	312.01	38432	75990	µg/L
Dursban	304.01	77969	2921882	µg/L
Dyfonate	339.00	81294	944229	µg/L
Dylox	340.00	39014	52686	µg/L
EC	449.01	00094		µmhos/cm
EDB	8.01	77651	106934	µg/L
EPN	344.00	81290	2104645	µg/L
EPTC	345.00	81894	759944	µg/L
Endosulfan	341.00	34361	959988	µg/L
Endosulfan I	341.01	34361	959988	µg/L
Endosulfan II	342.00	34356	33213659	µg/L
Endosulfan Sulfate	172.00	34351	1031078	µg/L
Endothall	343.00	38926	145733	µg/L
Endrin	174.00	39390	72208	µg/L
Endrin Aldehyde	173.00	34366	7421934	µg/L
Endrin Ketone	490.00	78008	53494705	µg/L
Enide	333.01	78004	957517	µg/L
Epichlorohydrin	604.00	106898		µg/L
Eptam	345.01	81894	759944	µg/L
Etazine	428.01	38542	26259450	µg/L
Ethanol	346.00	77004	64175	µg/L
Ethenylbenzene	74.04	77128	100425	µg/L
Ethion	175.00	39398	563122	µg/L
Ethoprop	634.00	81758	13194484	µg/L
Ethyl acetate	176.00	81585	141786	µg/L
Ethyl acrylate	605.00		140885	µg/L
Ethyl alcohol	346.01	77004	64175	µg/L
Ethyl isopropyl ketone	95.01	78133	108101	µg/L
Ethylan	411.01	39034	72560	µg/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Ethylbenzene	61.00	34371	100414	μg/L
Ethylene dibromide	8.02	77651	106934	μg/L
Ethylene dichloride	10.01	34531	107062	μg/L
Ethylene glycol	347.00	77023	107211	μg/L
Ethylene thiourea	348.01	38928	96457	μg/L
Ethylidene thiourea	348.00	38928	96457	μg/L
Evik	275.01	82184	834128	μg/L
Fecal Coliform, MFM-FCBR	505.00	31616		#/100ml
Fenamiphos	349.00	38929	22224926	μg/L
Fenarimol	635.00			μg/L
Fensulfothion	350.00	38684	115902	μg/L
Fenthion	351.00	38685	55389	μg/L
Fenuron	352.00	38468	101428	μg/L
Ferbam	353.00	38806	14484641	μg/L
Ferric(3+)	188.01	01045	7439896	μg/L
Ferrous(2+)	188.02	01045	7439896	μg/L
Fluchloralin	354.00	79194	3324539	μg/L
Fluoranthene	177.00	34376	206440	μg/L
Fluorene	62.00	34381	86737	μg/L
Fluorescein(Sodium)	178.00		518478	
Fluoride	179.00	00950	16984488	mg/L
Fluormeturon	355.00	38811	2164172	μg/L
Fluridone	636.00		59756604	μg/L
Foaming Agents	606.00	01288		mg/L
Folex	369.01	39019	150505	μg/L
Folpet	607.00	46351	133073	μg/L
Fonofos	339.01	81294	944229	μg/L
Formaldehyde	356.00	71880	50000	mg/L
Freon 113	3.01	77652	76131	μg/L
Freon 12, Halon	162.01	34668	75718	μg/L
Furadan	296.01	81405	1563662	μg/L
Furazolidone	608.00	67458		μg/L
Furium	609.00			μg/L
Furmecyclox	610.00		60568050	μg/L
Gardona	581.01	38877	961115	
Gardoprim	436.01	38559	5915413	μg/L
Gasoline	471.00		6842596	
Gesatamin	280.01	82185	1610179	μg/L
Glyphosate	358.00	79743	1071836	μg/L
Grain alcohol	346.02	77004	64175	μg/L
Guthion	359.00	39580	86500	μg/L
Hardness, Total	248.00	00900	471341	mg/L CaCO3
Heptachlor	181.00	39410	76448	μg/L
Heptachlor Epoxide	180.00	39420	1024573	μg/L
Heptene	182.00	81589	25339564	μg/L
Hexachlorobenzene	183.00	39700	118741	μg/L
Hexachlorobutadiene	63.00	34391	87683	μg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Hexachlorocyclohexane	132.01	81283	608731	µg/L
Hexachlorocyclohexane (alpha)	265.04	39337	319846	µg/L
Hexachlorocyclopentadiene	64.00	34386	77474	µg/L
Hexachloroethane	65.00	34396	67721	µg/L
Hexazinone	360.00	38815	51235042	µg/L
Hydram	394.02	82199	2212671	µg/L
Hydrazine	184.00	81313	302012	mg/L
Hydrocarbons, Total	473.00	81336		mg/L
Hydrocarbons, Total Fuel	462.00			
Hydrocarbons, Total Petroleum	461.00	46116	14280309	mg/L
Hydroxide	185.00	71830	14280309	mg/L
Hydroxide as CaCO3	456.00			
Hyvar	289.01	82198	314409	µg/L
IPC	423.01	39052	122429	µg/L
Imidan	361.00	39800	732116	µg/L
Indeno(1,2,3-cd)pyrene	186.00	34403	193395	µg/L
IntStd: 2,4,6-Tribromophenol	559.00	34719	118796	µg/L
IntStd: Hexabromobenzene	560.00			
Ion Balance	451.00			%
Ioxynil	561.00		16898341	µg/L
Iron, Dissolved	323.00	01046	7439896	µg/L
Iron, Total	188.00	01045	7439896	µg/L
Iron, Total Recoverable	362.00	00980	7439896	µg/L
Isobutylbenzene	552.00	77334	538932	µg/L
Isophorone	66.00	34408	78591	µg/L
Isopropyl carbanilate	423.02	39052	122429	µg/L
Isopropylbenzene (Cumene)	309.01	77223	98828	µg/L
Karmex	335.01	39650	330541	µg/L
Kepone	298.01	81281	143500	µg/L
Kerb	419.01	39080	23950585	mg/Kg
Kerosene	363.00	78878	8008206	µg/L
Kjeldahl-N, Total	249.00	00625	17778880	mg/L as N
Langlier Index	500.00			
Lead, Dissolved	402.00	01049	7439921	µg/L
Lead, Organic	463.00			
Lead, Total	403.00	01051	7439921	µg/L
Lead, Total Recoverable	189.00	01114	7439921	µg/L
Lindane	357.01	39340	58899	µg/L
Linuron	364.00	39530	330552	µg/L
Lithium	466.00	01130	7439932	µg/L
Lorsban	304.02	77969	2921882	µg/L
MBAS	233.01	34790	7429905	mg/L
MCPA	367.00	39151	94746	µg/L
MCPA Dimethylamine Salt	367.01	39151	94746	µg/L
MCPB	368.00	38486	94815	µg/L
MCPP (Water, Total)	562.00	38491	93652	µg/L
MEK	376.01	81595	78933	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
MIBK	34.02	78133	108101	µg/L
MSMA	385.00	38935	2163806	µg/L
Magnesium as CaCO3	519.00	00920	7439954	mg/L
Magnesium, Dissolved	518.00	00925	7439954	mg/L
Magnesium, Total	191.00	00927	7439954	mg/L
Malathion	192.00	39530	121755	µg/L
Mancozeb	365.00	38831	8018017	µg/L
Maneb	366.00	38835	12427382	µg/L
Manganese, Dissolved	404.00	01056	7439965	µg/L
Manganese, Total	193.00	01055	7439965	µg/L
Manganese, Total Recoverable	405.00	01123	7439965	µg/L
Matacil	277.01	38404	2032599	µg/L
Mercury, Dissolved	477.00	71890	7439976	µg/L
Mercury, Total	476.00	71900	7439976	µg/L
Mercury, Total Recoverable	194.00	71901	7439976	µg/L
Merphos	369.00	39019	150505	µg/L
Mesitylene	370.00	77226	108678	µg/L
Metasystox	371.00	39020	8022002	µg/L
Methidathion	374.00	78879	950378	µg/L
Methiocarb	373.00	38500	2032657	µg/L
Methomidophos	372.00	38927	10265926	µg/L
Methomyl	375.00	39051	16752775	µg/L
Methoxychlor	195.00	39480	72435	µg/L
Methyl Phenols, Total	378.00	45058	1319773	µg/L
Methyl Trithion	197.00	39790	953173	µg/L
Methyl Xylenes, Total	444.01	78136	25551137	µg/L
Methyl bromide	49.01	34413	74839	µg/L
Methyl chloride	55.01	34418	74873	µg/L
Methyl ethyl ketone	376.00	81595	78933	µg/L
Methyl isobutyl ketone	34.01	78133	108101	µg/L
Methyl ketone	40.03	81552	67641	µg/L
Methyl n-butyl ketone	25.01	77103	591786	µg/L
Methyl n-propyl ketone	97.01	77060	107879	µg/L
Methyl paraoxon	637.00			µg/L
Methylbenzene	76.01	34010	108883	µg/L
Methylcyclohexane	198.00	77100	108872	µg/L
Methylene Blue Active Substances	493.00	38260	61734	
Methylene bromide	160.01	81522	106934	µg/L
Methylene chloride	68.00	34423	75092	µg/L
Metolachlor	163.00		51218452	µg/L
Metribuzin	379.00	81408	21087649	µg/L
Mevinphos	413.01	39610	7786347	µg/L
Mexacarbate	380.00	38507	315184	µg/L
Mirex	381.00	39755	2385855	µg/L
Modown	382.00	78883	42576023	µg/L
Molinate	394.01	82199	2212671	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Molybdenum	467.00	01060	7439987	µg/L
Monitor	372.01	38927	10265926	µg/L
Monochloroethene	82.04	38175	75014	µg/L
Monochloroethylene	82.01	39175	75014	µg/L
Monocrotophos	383.00	81890	6923224	µg/L
Monsodium methyl arsonate	385.01	38935	2163806	µg/L
Monuron	384.00	38511	150685	µg/L
N-Nitroso-N-methylethylamine	613.00	73613	10595956	µg/L
N-Nitroso-di-n-butylamine	614.00	73609	924163	µg/L
N-Nitroso-di-n-propylamine	69.00	34428	621647	µg/L
N-Nitrosodiethanolamine	615.00	73610	1116547	µg/L
N-Nitrosodiethylamine	616.00	73611	55185	µg/L
N-Nitrosodimethylamine	392.00	34438	62759	µg/L
N-Nitrosodiphenylamine	199.00	34433	86306	µg/L
N-Nitrosopyrrolidine	617.00	78206	930552	µg/L
NH3-N, Total	109.01	00610	17778880	mg/L as N
NO3+NO2-N, Total	321.01	00630	17778880	mg/L as N
Naled	386.00	38855	300765	µg/L
Naphthalene	70.00	34696	91203	µg/L
Napropamide	387.00	79195	1529999	µg/L
Neburon	388.00	38521	555373	µg/L
Nemacure	349.01	38929	22224926	µg/L
Nickel, Dissolved	481.00	01065	7440020	µg/L
Nickel, Total	483.00	01067	7440020	µg/L
Nickel, Total Recoverable	200.00	01074	7440020	µg/L
Nitrate+Nitrite-N, Total	321.00	00630	17778880	mg/L as N
Nitrate-N	452.00	00620	17778880	mg/L as N
Nitrite-N	202.00	00615	17778880	mg/L as N
Nitrobenzene	71.00	34447	98953	µg/L
Nitrofen	389.00	81303	1836755	µg/L
Nitrofurazone	618.00	59870		µg/L
Nitroguanidine	203.00	79753	556887	µg/L
Nonadecane	391.00	77822	629925	µg/L
Norflurazon, in Water	639.00	78064		µg/L
OBPA	206.00	58366		
Octachloronaphthalene	563.00		2234131	µg/L
Odor	619.00			std. units
Oil & Grease	207.00	03582		mg/L
Ordram	394.00	82199	2212671	µg/L
Orthene	395.00	81815	30560191	µg/L
Oryzalin	396.00	78884	19044883	µg/L
Ovex	397.00	39022	80331	µg/L
Oxamyl	398.00	38865	23135220	µg/L
Oxydisulfoton (Disyston Sulphoxide)	643.00	81030	2497076	µg/L
PAH (Polyaromatic hydrocarbons)	620.00			µg/L
PBB (Polybrominated Biphenyls)	621.00		59536651	µg/L
PCB	219.01	76012	1336363	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
PCB-1016	114.01	34671	12674112	µg/L
PCB-1221	115.01	39488	1104282	µg/L
PCB-1232	116.01	39492	11141165	µg/L
PCB-1242	117.01	39496	53469219	µg/L
PCB-1248	118.01	39500	12672296	µg/L
PCB-1254	119.01	39504	11097691	µg/L
PCB-1260	120.01	39508	11096825	µg/L
PCE	75.01	34475	127184	µg/L
PCNB	409.00	39029	81316	µg/L
PCP	213.01	39032	87865	µg/L
PID Reading	470.00			
Paraquat	399.00	82416	4685147	µg/L
Parathion	212.00	39540	56382	µg/L
Parathion, Ethyl-	400.00	46315	56382	µg/L
Parathion, Methyl-	401.00	39600	298000	µg/L
Pebulate, Water, Whole	640.00	79192		µg/L
Pendimethalin	222.02	79190	40487421	µg/L
Penoxalin	222.00	82410	40487421	µg/L
Pentachlorobenzene	410.00	77793	608935	µg/L
Pentachlorophenol	213.00	39032	87865	µg/L
Perchlorate	214.00			
Perchloroethene	75.03	34475	127184	µg/L
Perchloroethylene	75.02	34475	127184	µg/L
Persulfate-N, Total	580.00		7727540	µg/L
Perthane	411.00	39034	72560	µg/L
Phenanthrene	216.00	34461	85018	µg/L
Phencapton (Water, Whole)	564.00	81289	2275141	µg/L
Phenol	73.00	34694	108952	µg/L
Phenol, 4-AAP	217.00		108952	
Phenylethylene	74.02	77128	100425	µg/L
Phorate	218.00	46313	298022	µg/L
Phosalone	412.00	81291	2310170	µg/L
Phosdrin	413.00	39610	7786347	µg/L
Phosmet	361.01	39800	732116	µg/L
Phosphamide	331.01	46314	60515	µg/L
Phosphamidon	414.00	78881	13171216	µg/L
Phosphate-P, Diss Ortho	498.00	00671	7723140	mg/L as P
Phosphate-P, Ortho	205.00	00660	14265442	mg/L as PO 4
Phosphorodithioic acid, O,O,S-trim+	573.00	39580	86500	µg/L
Phosphorous-P, Total	251.00	00665	7723140	mg/L as P
Picloram	257.00	39720	1918021	µg/L
Polychlorinated biphenyl	219.00	76012	1336363	µg/L
Potassium, Dissolved	517.00	00935	7440097	mg/L
Potassium, Total	220.00	00937	7440097	mg/L
Princep	430.01	39055	122349	µg/L
Profluralin	415.00	38872	26399360	µg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Prometon	416.00	39056	1610180	µg/L
Prometryn	417.00	39057	7287196	µg/L
Pronamide	419.00	39080	23950585	µg/L
Propachlor	418.00	38533	1918167	µg/L
Propane	420.00	82358	74986	µg/L
Propanone	40.01	81552	67641	µg/L
Propargite	421.00	82065	2312358	mg/L
Propazine	422.00	39024	139402	µg/L
Propham	423.00	39052	122429	µg/L
Propoxur	424.00	38537	114261	µg/L
Propylbenzenes, Total	291.01	45046		µg/L
Propylene oxide	622.00	77011	75569	µg/L
Prowl	222.01	79190	40487421	µg/L
Prowl, Lechate	221.00	79190	40487421	µg/L
Prowl, Soil	223.00	85793	40487421	µg/L
Pyrene	224.00	34469	129000	µg/L
Pyrethrins	425.00	39930	8003347	µg/L
Radium 226	623.00	09501	13982633	pCi/L
Radium 226 & 228	624.00	11503		pCi/L
Retene	457.00	73076	483658	µg/L
Roneet	311.01	81892	1134232	µg/L
Ronnel	427.00	39357	299843	µg/L
Round-up	426.00	39941	1071836	µg/L
SCA	225.00			
Secbumeton	428.00	38542	26259450	µg/L
Selenium, Dissolved	484.00	01145	7782492	µg/L
Selenium, Total	485.00	01147	7782492	µg/L
Selenium, Total Recoverable	226.00	00981	7782492	µg/L
Sencore	379.01	81408	21087649	µg/L
Sevin	294.01	77700	63252	µg/L
Siduron	429.00	38548	1982496	µg/L
Silica (SIO2)	227.00	00992	7631869	µg/L
Silicate	497.00	00958		mg/L
Silver, Dissolved	495.00	01075	7440224	µg/L
Silver, Total	234.00	01077	7440224	µg/L
Silver, Total Recoverable	228.00	01079	7440224	µg/L
Simazine	430.00	39055	122349	µg/L
Simetryn	431.00	39054	1014706	µg/L
Sodium Absorption Ratio	501.00	00931	7440235	SAR
Sodium Chlorate	229.00	00726	7775099	µg/L
Sodium, Total	450.00	00929	7440235	mg/L
Solids, Total Dissolved	247.03	70300		µg/L
Solids, Total Suspended	496.01	74016		mg/L
Specific Conductance (Field)	502.00	00094		µmhos/cm
Specific Conductance @ 25C (LAB)	151.00	00095		µmhos/cm
Specific Conductance(fIELD)	449.00	00094		µmhos/cm

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Stirofos	432.00	38877	961115	µg/L
Strontium-90	625.00	13501	10098972	pCi/L
Styrene	74.00	77128	100425	µg/L
Sulfate, Total	230.00	00945	14808798	mg/L as SO4
Sulfide, Total	231.00	00745	18496258	mg/L
Sulfite, Total	232.00	00740	14265453	mg/L as SO3
Sumitol	428.02	38542	26259450	µg/L
Supracide	374.01	78879	950378	µg/L
Surfactants	233.00	03581		mg/L
Surflan	396.01	78884	19044883	µg/L
Surrog: 1,2-Dichloroethane-d4	460.00			%
Surrog: 1,4-Bromofluorobenzene	187.00			
Surrog: 1-Bromo-2-floroethane	157.00			
Surrog: 2-Chlorophenol-d4 (spike)	565.00	95978		
Surrog: 2-Fluorobiphenyl	479.00			
Surrog: 2-Fluorophenol	480.00			
Surrog: 4-Chloroaniline-d4	566.00			
Surrog: Dibutylchlorendate (spike)	567.00			
Surrog: Fluorene-d10 (spike)	568.00			
Surrog: Nitrobenzene-d5	474.00			
Surrog: Phenol-d5	526.00			
Surrog: Pyrene-d10 (spike)	377.00			
Surrog: Toluene-d8	458.00			%
Surrog: p-Terphenyl-d14	525.00			
Sutan	290.01	81410	2008415	µg/L
Swep	433.00	38555	918189	µg/L
Systox	325.01	39560	8065483	µg/L
T3	236.00	78166		µg/L
T4	237.00	51489		µg/L
TCE	80.01	39180	79016	µg/L
TDS	247.01	70300		µg/L
TEPP	435.00	39620	107493	µg/L
TFH	462.01			
TKN	249.01	00625	17778880	mg/L as N
TOC	250.01	00680	7440440	µg/L
TOS (Calculated)	245.00			
TPH	461.01	46116	14280309	mg/L
TPN, Total Persulfate Nitrogen	580.01		7727540	µg/L
TSS	496.00		74016	mg/L
Tebuthiuron	190.00		34014181	µg/L
Tedion	434.00	39808	116290	µg/L
Temik	274.01	39053	116063	µg/L
Temperature, 0 C	238.00	00010	0	C
Temperature, 0 F	239.00	00011	0	F
Terbacil	204.00		5902152	µg/L
Terbuthylazine	436.00	38559	5915413	µg/L
Terbutryn	437.00	38887	886500	µg/L

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Tetrachloroethene	75.00	34475	127184	µg/L
Tetrachloroethylene	75.04	34475	127184	µg/L
Tetrachloromethane	51.01	32102	56235	µg/L
Tetrachlorophenol	438.00	81849	25167833	µg/L
Tetrachlorvinphos	581.00	38877	961115	
Tetradifon	434.01	39808	116290	µg/L
Tetraethyldiphosphate	435.01	39620	107493	µg/L
Tetrahydrofuran	241.00	81607	109999	µg/L
Thallium, Dissolved	522.00	01057	7440280	µg/L
Thallium, Total	523.00	01059	7440280	µg/L
Thallium, Total Recoverable	242.00	00982	7440280	µg/L
Thiophanate	439.01	78880	23564069	µg/L
Thiosulfate	243.00			
Tin, Dissolved	513.00	01100	7440315	µg/L
Tin, Total	512.00	01102	7440315	µg/L
Tin, Total Recoverable	468.00	00983	7440315	µg/L
Titanium	469.00	01150	7440326	µg/L
Toluene	76.00	34010	108883	µg/L
Topsin-MR	439.00	78880	23564069	µg/L
Total BTEX	478.00	34103		µg/L
Total BTX	72.00	34103	n/a	µg/L
Total Dissolved Solids (residue)	247.00	70300		µg/L
Total Filterable Residue	247.02	70300		µg/L
Total Organic Halides	503.00	70353		µg/L
Total Organics	486.00	81299		µg/L
Total Solids	253.00	70297		Kg/100Gal
Total Solids	252.00	70318		%
Total Trihalomethanes	494.00	82080		µg/L
Toxaphene	255.00	39400	8001352	µg/L
Treflan	443.01	81284	1582098	µg/L
Triadimefon	440.00	38892	43121433	µg/L
Trichlorobenzoic acid	551.00	50317		
Trichloroethene	80.00	39180	79016	µg/L
Trichloroethylene	80.02	39180	79016	µg/L
Trichlorofluoromethane	83.00	34488	75694	µg/L
Trichloromethane	54.01	32106	67663	µg/L
Trichlorophon	340.01	39014	52686	µg/L
Trichlorotrifluoroethane	3.02	81611	26523648	µg/L
Trichlorotrinitrobenzenes,Total	258.00			
Tricyclazole, Water, Whole	641.00	38902	41814782	µg/L
Trifluralin	443.00	81284	1582098	µg/L
Trimethyl Benzenes, Total	444.00	78136	25551137	µg/L
Trimethyl phosphate	626.00		512561	µg/L
Trinitrobenzenes, Total	259.00			
Triphenyl phosphate (Water, Whole)	569.00	77881	115866	µg/L
Trithion	297.01	39786	786196	µg/L
Tritium	627.00	07000	10028178	pCi/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
Turbidity(Lab)	260.00	82079		NTU
UDMH	261.00	81314	57147	mg/L
Vanadium (Dissolved)	262.00	10085	7440622	
Velpar	360.01	38815	51235042	μg/L
Vernam	445.01	82200	1929777	μg/L
Vernolate	445.00	82200	1929777	μg/L
Vinyl acetate	81.00	77057	108054	μg/L
Vinyl chloride	82.00	39175	75014	μg/L
Vinyl trichloride	4.01	34511	79005	μg/L
Vinylbenzene	74.01	77128	100425	μg/L
Volatile Dissolved Solids	263.00			
Volatile Organic Compounds	487.00		78733	mg/L
Xylene Isomers, M + P, Whole Water	578.00		85795	μg/L
Xylene Isomers, O + P, Whole Water	32.00		80353	μg/L
Xylene, m-	67.00	77134	108383	μg/L
Xylene, o-	77.00	77135	95476	μg/L
Xylene, p-	475.00	77133	106423	μg/L
Xylenes, Total	201.00	34020	1330207	μg/L
Zinc, Dissolved	504.00	01090	7440666	μg/L
Zinc, Total	507.00	01092	7440666	μg/L
Zinc, Total Recoverable	264.00	01094	7440666	μg/L
Zineb	447.00	38912	12122677	μg/L
Ziram	446.00	38917	137304	μg/L
Zolone	412.01	81291	2310170	μg/L
Zytron	336.01	81285	299854	μg/L
a-BHC	265.00	39337	319846	μg/L
a-Endosulfan	266.01	34361	959988	μg/L
alpha-BHC	265.03	39337	319846	μg/L
alpha-Benzene hexachloride	265.01	39337	319846	μg/L
alpha-Chlordane	530.00	39348	5103719	μg/L
alpha-Endosulfan	266.00	34361	959988	μg/L
alpha-Lindane	265.02	39337	319846	μg/L
b-BHC	267.00	39338	319857	μg/L
b-Endosulfan	268.00	34356	33213659	μg/L
beta-BHC	267.03	39338	319857	μg/L
beta-Benzene hexachloride	267.01	39338	319857	μg/L
beta-Endosulfan	268.01	34356	33213659	μg/L
beta-Lindane	267.02	39338	319857	μg/L
cis-1,2-Dichloroethene	326.00	77093	156592	μg/L
cis-1,2-Dichloroethylene	326.01	77093	156592	μg/L
cis-1,3-Dichloropropene	56.00	34704	10061015	μg/L
cis-1,3-Dichloropropylene	56.01	34704	10061015	μg/L
d-BHC	269.00	34259	319868	μg/L
delta-BHC	269.03	34259	319868	μg/L
delta-Benzene hexachloride	269.01	34259	319868	μg/L

APPENDIX D: CHEMICAL DICTIONARY
01/27/93

COMP_NAME	JHK_NO	STORET_NO	CAS_NO	UNITS
delta-Lindane	269.02	34259	319868	µg/L
g-BHC	357.00	39340	58899	µg/L
gamma-BHC (Lindane)	357.04	39340	58899	µg/L
gamma-Benzene hexachloride	357.03	39340	58899	µg/L
gamma-Chlordane	529.00	39065	5103742	µg/L
gamma-Lindane	357.02	39340	58899	µg/L
m-Diethylbenzene	549.01	77348	141935	µg/L
m-Dimethylbenzene	67.04	77134	108383	µg/L
m-Xylene	67.03	77134	108383	µg/L
meta-Xylene	67.02	77134	108383	µg/L
n-Butylbenzene	539.00	78483	104518	µg/Kg
n-Octacosane	390.00	78116	630024	µg/L
n-Propylbenzene	393.00	77224	103651	µg/L
o,p'-DDT	270.00	39305	789026	µg/L
o,p'-TDE	271.00	39315	53190	µg/L
o-Chloronitrobenzene	628.00		88732	µg/L
o-Chlorophenol	24.01	34586	95578	µg/L
o-Diethylbenzene	548.01	77340	135013	µg/L
o-Dimethylbenzene	77.03	77135	95476	µg/L
o-Phenylenediamine	629.00	73628	106503	µg/L
o-Toluidine	630.00	77142	95534	µg/L
o-Xylene	77.01	77135	95476	µg/L
ortho-Xylene	77.04	77135	95476	µg/L
p,a,a,a-Tetrachlorotoluene	632.00			µg/L
p,p'-DDD	208.02	39360	72548	µg/L
p,p'-DDE	209.02	39365	72559	µg/L
p,p'-DDT	210.02	39370	50293	µg/L
p,p'-TDE	272.00	39360	72548	µg/L
p-Chloro-m-cresol	31.02	34452	59507	µg/L
p-Chloronitobenzene	631.00		100005	µg/L
p-Cresol	35.01	77146	106445	µg/L
p-Diethylbenzene	550.01	77345	105055	µg/L
p-Dimethylbenzene	475.04	77133	106423	µg/L
p-Isopropyltoluene	538.00	77356	99876	µg/L
p-Nitroaniline	36.01	73278	100016	µg/Kg
p-Nitrophenol	37.01	34646	100027	µg/L
p-Xylene	475.02	77133	106423	µg/L
pH	448.00	00400		std. units
para-Xylene	475.01	77133	106423	µg/L
propyzamide	419.02	39080	23950585	mg/Kg
sec-Butylbenzene	543.00	78485	135988	µg/Kg
tert-Butylbenzene	537.00	78448	98066	µg/Kg
trans-1,2-Dichloroethene	78.00	34546	156605	µg/L
trans-1,2-Dichloroethylene	78.01	34546	156605	µg/L
trans-1,3-Dichloropropene	79.00	34699	10061026	µg/L
trans-1,3-Dichloropropylene	79.01	34699	10061026	µg/L
269	338.40			

APPENDIX E: LABORATORY QUALIFIERS

LIST OF QUALIFIERS FOR NUMERIC RESULTS

REMARK CODE	DEFINITION
B	Analyte is found in the blank as well as the sample, indicated possible/probable blank contamination.
J	Estimated value; not accurate.
M	Presence of material verified but not quantified
U or K	Compound was analyzed for but not detected. The associated numerical value is the sample quantitation detection limit.
UJ	Compound was analyzed for but not detected. The number is the estimated minimum detection limit.
C	The value is one of, or the sum of both, Benzo (b) Fluoranthene and Benzo (k) Fluoranthene.
X	Many background organisms.
H	Over holding time. Analysis run.
G	Improper container.
Z	Sample low due to interfering substance.
D	Sample high due to interfering substance.
IS	Interfering Substance.
P	Greater than (>).
A	Less than (<).
LMX	Lab Matrix Number.
LBK	Lab Blank Number.

APPENDIX E CONTINUED:

Data Qualifier Definitions

For the purpose of this document the following code letters and associated definitions are provided:

dr	- dry weight
wt	- wet weight
R	- The data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification.
N	- Presumptive evidence of presence of material.
NJ	- Presumptive evidence of the presence of the material at an estimated quantity.
UJ	- The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

The reviewer may determine that qualifiers other than those used in this document are necessary to describe or qualify the data. In these instances, it is the responsibility of each reporting entity to thoroughly document/explain the qualifiers used and notify Ecology prior to submition of data packages.

APPENDIX F: COUNTY FIPS CODES

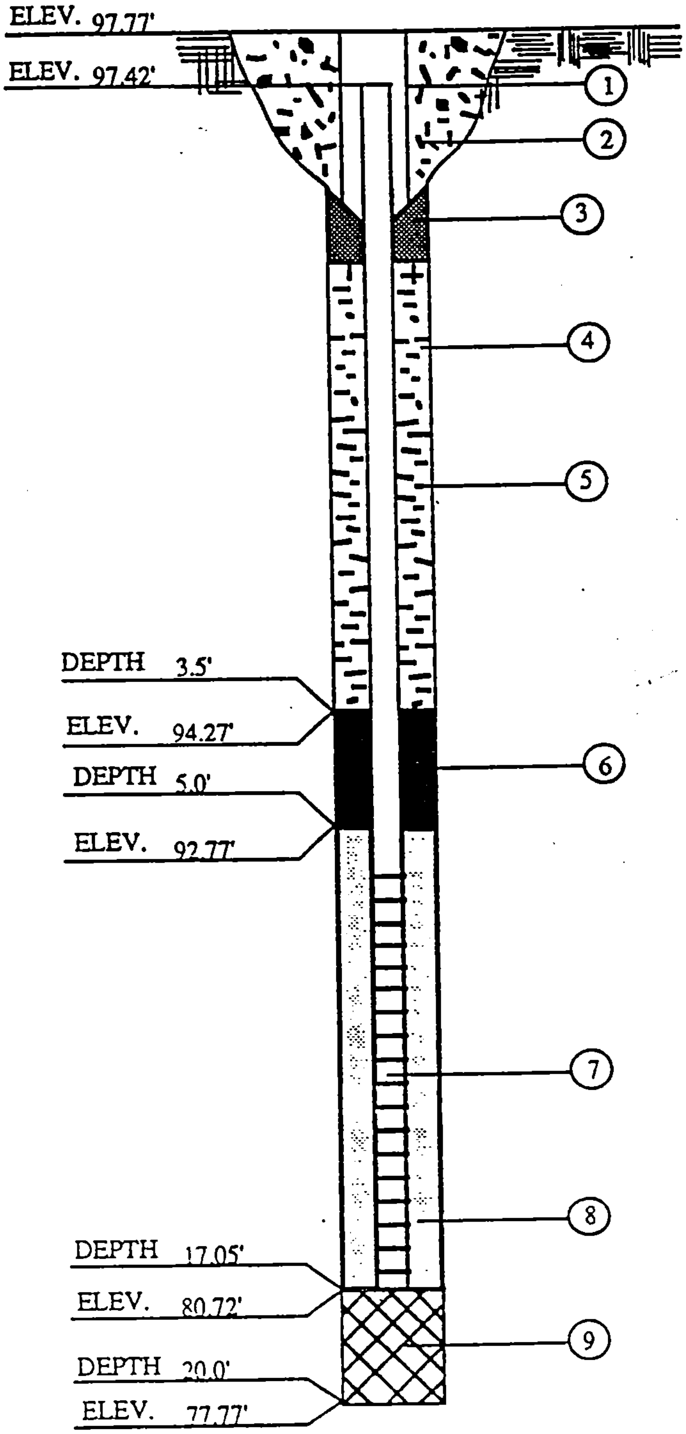
WASHINGTON

001 ADAMS
003 ASOTIN
005 BENTON
007 CHELAN
009 CLALLAM
011 CLARK
013 COLUMBIA
015 COWLITZ
017 DOUGLAS
019 FERRY
021 FRANKLIN
023 GARFIELD
025 GRANT
027 GRAYS HARBOR
029 ISLAND

031 JEFFERSON
033 KING
035 KITSAP
037 KITTITAS
039 KLICKITAT
041 LEWIS
043 LINCOLN
045 MASON
047 OKANOGAN
049 PACIFIC
051 PEND OREILLE
053 PIERCE
055 SAN JUAN
057 SKAGIT
059 SKAMANIA
061 SNOHOMISH
063 SPOKANE
065 STEVENS
067 THURSTON
069 WAHKIAKUM
071 WALLA WALLA
073 WHATCOM
075 WHITMAN
077 YAKIMA

APPENDIX B
BORING LOGS

DPRA



MONITORING WELL CONSTRUCTION INFORMATION

JOB NO. CASCADE NATURAL GAS COMPANY

BORING/WELL NO. MW-1

DATE 04/10/91

FIELD REPRESENTATIVE GU/SKW

1. PROTECTIVE CASING YES NO
   LOCKING YES NO
2. CONCRETE SEAL YES NO
3. TYPE OF SURFACE SEAL (IF INSTALLED)
   BENTONITE CHIPS
4. SOLID PIPE TYPE PVC
   SOLID PIPE LENGTH 5.7 ft.
   JOINT TYPE SLIP/GLUED/THREADED
5. TYPE OF BACKFILL BENTONITE CHIPS
   HOW INSTALLED - TREMIE
   FROM SURFACE
6. TYPE OF LOWER SEAL (IF INSTALLED)
   BENTONITE CHIPS
7. SCREEN TYPE PVC
   SCREENED PIPE LENGTH 11.0 ft.
   SLOT-SIZE 0.010 in. SLOTTED LENGTH 9.4 ft.
   SCREEN DIAMETER 4.0 in.
8. TYPE OF BACKFILL AROUND SCREEN
   FILTER SAND
9. TYPE OF BACKFILL FILTER SAND
10. DRILLING METHOD AIR HAMMER
11. ADDITIVES USED (IF ANY)
   POTABLE WATER

WATER LEVEL 9.78' DATE 04/10/91

DPRA E-1500 First National Bank Bldg. 332 Minnesota Street St. Paul, Minnesota 55101 612-227-6500

LOG OF TEST BORINGS

PROJECT NAME: CASCADE NATURAL GAS CO.	**PROJECT NUMBER:** 3751.007
LOCATION: 512 DECATUR AVENUE, SUNNYSIDE, WASHINGTON	
BORING NUMBER: MW-1	**SURFACE ELEVATION:** 97.77'

Sample No. or Time	Sample Type	Recovery (inches)	Moisture	N	PID Reading (ppm)	USCS Symbol	Depth (feet)	DESCRIPTION	Geologic Origin
								.2 BLACKTOP	FILL
1	AUGER	-	M	-	15	FILL		Brown, Fine Grained, SILTY SAND WITH A LITTLE GRAVEL.	COARSE ALLUVIUM
2	SS	20	M	14	15	SM	5	Brown, Fine Grained, Medium Dense, SILTY SAND.	
3	SS	20	Wb	4	15	ML	10	Brown with Gray, Soft to Stiff, SILT.	FINE ALLUVIUM
4	SS	20	W	13	900	ML	15		
5	SS	20	Wb	24	20	SM	20	Brown, Fine Grained, Dense, SILTY SAND.	COARSE ALLUVIUM
								END OF BORING 20.0'	
							25		
							30		
							35		

WATER LEVEL MEASUREMENTS (feet)

Date	Time	Sampled Depth	Casing Depth	Cave-in Depth	Water Level
04/10/91	1150	20.0	18.0	17.8	12.4
04/10/91	-	WELL	INSTALLED		9.78

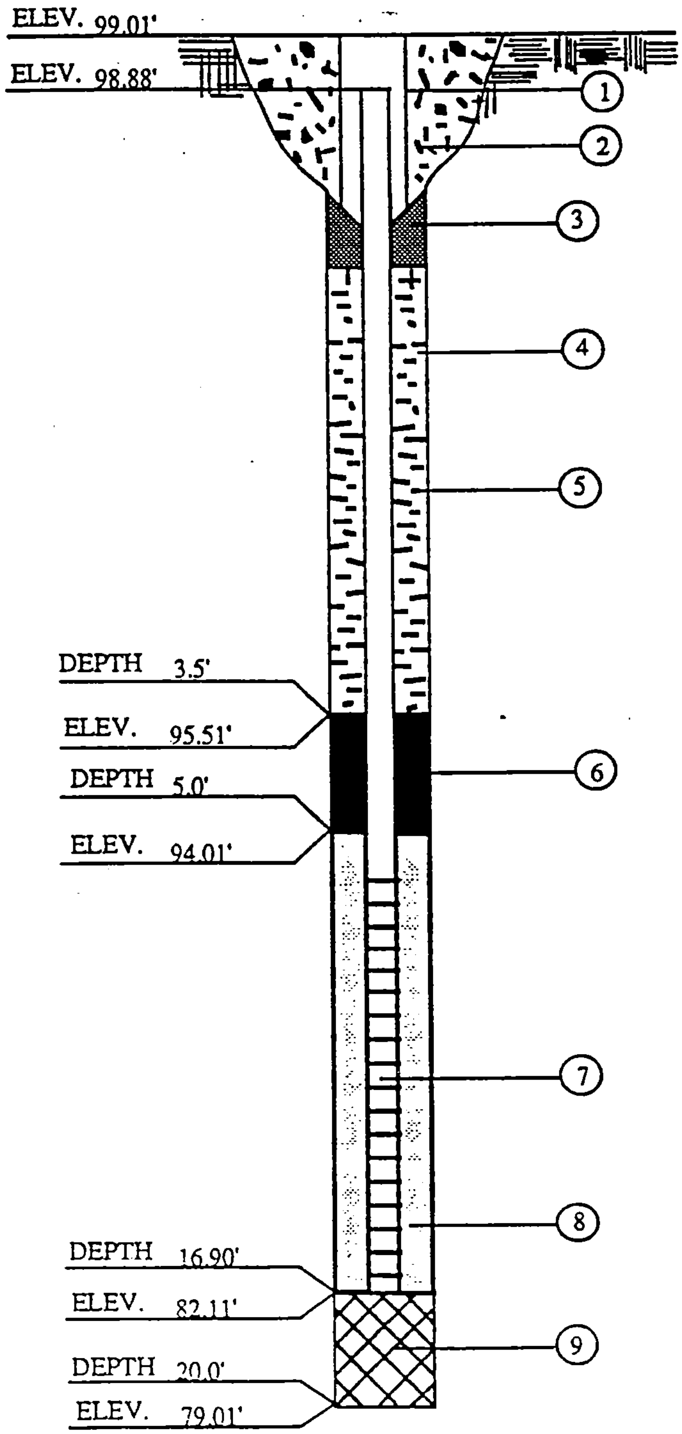
START 04/10/91 COMPLETION 04/10/91 @

Drilling Method 6" I.D. HOLLOW STEM AUGER

Backfill Method INSTALL WELL

Field Representative SKW/GU

DPRA



MONITORING WELL CONSTRUCTION INFORMATION

JOB NO. CASCADE NATURAL GAS COMPANY

BORING/WELL NO. MW-2

DATE 04/10/91

FIELD REPRESENTATIVE GU/SKW

1. PROTECTIVE CASING YES NO

   LOCKING YES NO

2. CONCRETE SEAL YES NO

3. TYPE OF SURFACE SEAL (IF INSTALLED)

   BENTONITE CHIPS

4. SOLID PIPE TYPE PVC

   SOLID PIPE LENGTH 5.77 ft.

   JOINT TYPE SLIP/GLUED/THREADED

5. TYPE OF BACKFILL BENTONITE CHIPS

   HOW INSTALLED - TREMIE
   FROM SURFACE

6. TYPE OF LOWER SEAL (IF INSTALLED)

   BENTONITE CHIPS

7. SCREEN TYPE PVC

   SCREENED PIPE LENGTH 11.0 ft.

   SLOT-SIZE 0.010 in. SLOTTED LENGTH 9.4 ft.

   SCREEN DIAMETER 4.0 in.

8. TYPE OF BACKFILL AROUND SCREEN

   FILTER SAND

9. TYPE OF BACKFILL FILTER SAND

10. DRILLING METHOD AIR HAMMER

11. ADDITIVES USED (IF ANY)

    POTABLE WATER

WATER LEVEL 8.65' DATE 04/10/91

DPRA E-1500 First National Bank Bldg. 332 Minnesota Street St. Paul, Minnesota 55101 612-227-6500

LOG OF TEST BORINGS

PROJECT NAME: CASCADE NATURAL GAS CO.	PROJECT NUMBER: 3751.007
LOCATION: 512 DECATUR AVENUE, SUNNYSIDE, WASHINGTON	
BORING NUMBER: MW-2	SURFACE ELEVATION: 99.01'

Sample No. or Time	Sample Type	Recovery (inches)	Moisture	N	PID Reading (ppm)	USCS Symbol	Depth (feet)	DESCRIPTION	Geologic Origin
								.2 BLACKTOP	FILL
1	AUGER	-	M	-	1.0	FILL		Brown, Fine Grained, SILTY SAND WITH A LITTLE GRAVEL, Black Top, and Roots.	
2	SS	15	M	16	3.0	FILL	5		
								Brown,Soft to Very Stiff, SILT, with a lens of Silty Clay at 14.0'.	FINE ALLUVIUM
3	SS	20	Wb	1	3.0	ML	10		
4	SS	20	W	23	3.0	ML	15		
								Brown, Fine Grained, Dense, SILTY SAND with lenses of Silt.	COARSE ALLUVIUM
5	SS	20	Wb	25	4.0	SM	20		
								END OF BORING 20.0'	
							25		
							30		
							35		

WATER LEVEL MEASUREMENTS (feet)

Date	Time	Sampled Depth	Casing Depth	Cave-in Depth	Water Level
04/10/91	1555	20.0	18.0	17.4	11.0
04/10/91	-	WELL INSTALLED			8.65

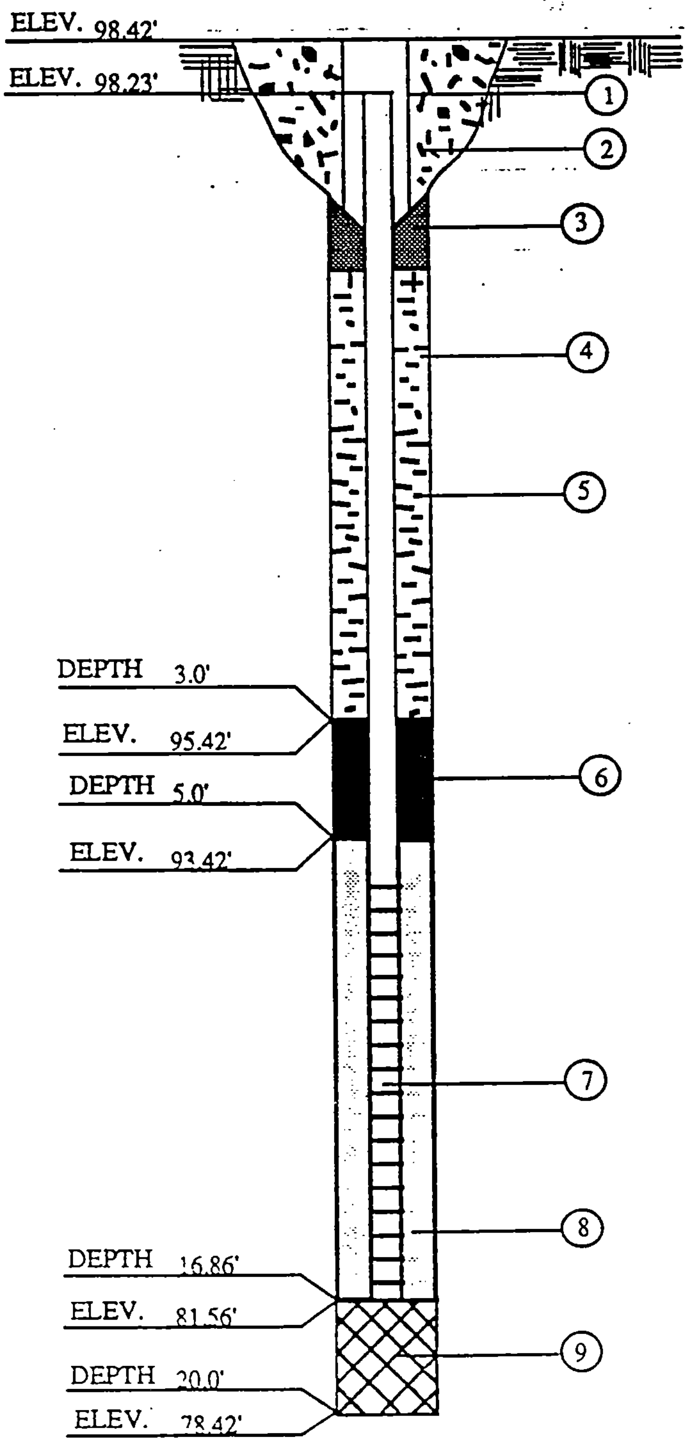
START 04/10/91 COMPLETION 04/10/91 @

Drilling Method 6" I.D. HOLLOW STEM AUGER

Backfill Method INSTALL WELL

SKETCH

DPRA



MONITORING WELL CONSTRUCTION INFORMATION

JOB NO. CASCADE NATURAL GAS COMPANY

BORING/WELL NO. MW-3

DATE 04/10/91

FIELD REPRESENTATIVE GU/SKW

1. PROTECTIVE CASING YES NO

   LOCKING YES NO

2. CONCRETE SEAL YES NO
3. TYPE OF SURFACE SEAL (IF INSTALLED)

   BENTONITE CHIPS

4. SOLID PIPE TYPE PVC

   SOLID PIPE LENGTH 5.86 ft.

   JOINT TYPE SLIP/GLUED/THREADED

5. TYPE OF BACKFILL BENTONITE CHIPS

   HOW INSTALLED - ~~TREMIE~~ FROM SURFACE

6. TYPE OF LOWER SEAL (IF INSTALLED)

   BENTONITE CHIPS

7. SCREEN TYPE PVC

   SCREENED PIPE LENGTH 11.0 ft.

   SLOT-SIZE 0.010 in. SLOTTED LENGTH 9.4 ft.

   SCREEN DIAMETER 4.0 in.

8. TYPE OF BACKFILL AROUND SCREEN

   FILTER SAND

9. TYPE OF BACKFILL FILTER SAND
10. DRILLING METHOD AIR HAMMER
11. ADDITIVES USED (IF ANY)

    POTABLE WATER

WATER LEVEL 8.90' DATE 04/10/91

DPRA E-1500 First National Bank Bldg. 332 Minnesota Street St. Paul, Minnesota 55101 612-227-6500

LOG OF TEST BORINGS

PROJECT NAME: CASCADE NATURAL GAS CO.	PROJECT NUMBER: 3751.007
LOCATION: 512 DECATUR AVENUE, SUNNYSIDE, WASHINGTON	
BORING NUMBER: MW-3	SURFACE ELEVATION: 98.42'

Sample No. or Time	Sample Type	Recovery (inches)	Moisture	N	PID Reading (ppm)	USCS Symbol	Depth (feet)	DESCRIPTION	Geologic Origin
								.3 BLACKTOP	FILL
1	AUGER	-	M	-	1.0	FILL		Dark Brown, Fine Grained, SILTY SAND WITH A LITTLE GRAVEL.	
2	SS	20	M	19	3.0	FILL SP-SM	5	Brown, Fine Grained, Dense, SILTY SAND.	COARSE ALLUVIUM
3	SS	20	Wb	3	4.0	ML	10	Brown with streaks of Gray, Soft to Very Stiff, SILT.	FINE ALLUVIUM
4	SS	20	Wb	14	175	ML	15		
5	SS	20	Wb	19	12.0	SM	20		
								END OF BORING 20.0'	
							25		
							30		
							35		

WATER LEVEL MEASUREMENTS (feet)

Date	Time	Sampled Depth	Casing Depth	Cave-in Depth	Water Level
04/11/91	1315	20.0	18.0	17.6	10.0
04/11/91	-	WELL INSTALLED			8.90

START 04/11/91 COMPLETION 04/11/91 @

Drilling Method 6" I.D. HOLLOW STEM AUGER

Backfill Method INSTALL WELL

Field Representative SKW/GU

SECOR

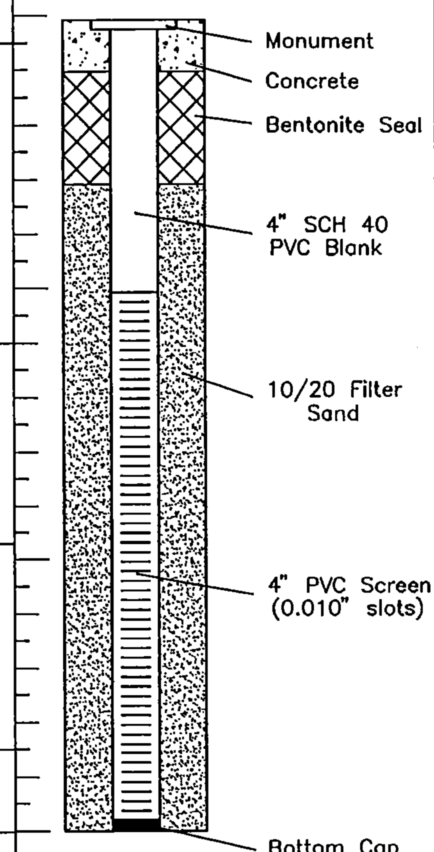
BORING LOG

BORING **MW-4**
PAGE 1 OF 1

PROJECT **CASCADE NATURAL GAS/SUNNYSIDE** LOCATION **512 EAST DECATUR AVENUE SUNNYSIDE, WASHINGTON**
SURFACE ELEVATION ______ CASING TOP ELEVATION **740.78******
START **7/19/93 1045** FINISH **7/19/93 1300**
SAMPLER **J. GIEBER** MONITORING DEVICE **MICROTIP PID**
SUBCONTRACTOR AND EQUIPMENT **ENVIRONMENTAL WEST EXPLORATION, MOBILE B-61**
COMMENTS **SAMPLES COLLECTED USING 2" I.D. SPLIT SPOON SAMPLER LINED WITH BRASS SLEEVES**

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading (ppm)	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification
			0	6" Concrete	
				Sand, light brown, very fine grained, moist, loose	SP
2/2/2/2	5–7	8	5		
				Silt, light brown, soft, wet	ML
1/1/1/3	8–10	25	▽		
			10	Sand, gray, saturated, loose, fine grained, strong hydrocarbon odor, sheen	SP
5/3/4/8	13–15	14			
				Silty Sand, brown, very fine grained, loose, wet	SM
		11	15	Boring terminated at 15 feet. Groundwater encountered at approximately 9 feet during drilling. Boring converted to a groundwater monitoring well on 7/19/93.	
			20		
			25		

Well Construction Details



**Note:
Casing top elevation datum established from U.S.C. & Gs. Brass disk in the northeast corner of City Hall building, having an elevation of 742.77 feet.

SECOR

BORING LOG

BORING MW-5

PAGE 1 OF 1

PROJECT: CASCADE NATURAL GAS/SUNNYSIDE

LOCATION: 512 EAST DECATUR AVENUE SUNNYSIDE, WASHINGTON

SURFACE ELEVATION:

CASING TOP ELEVATION:

START: 7/19/93 1515

FINISH: 7/19/93 1300

SAMPLER: J. GIEBER

MONITORING DEVICE: MICROTIP PID

SUBCONTRACTOR AND EQUIPMENT: ENVIRONMENTAL WEST EXPLORATION, MOBILE B-61

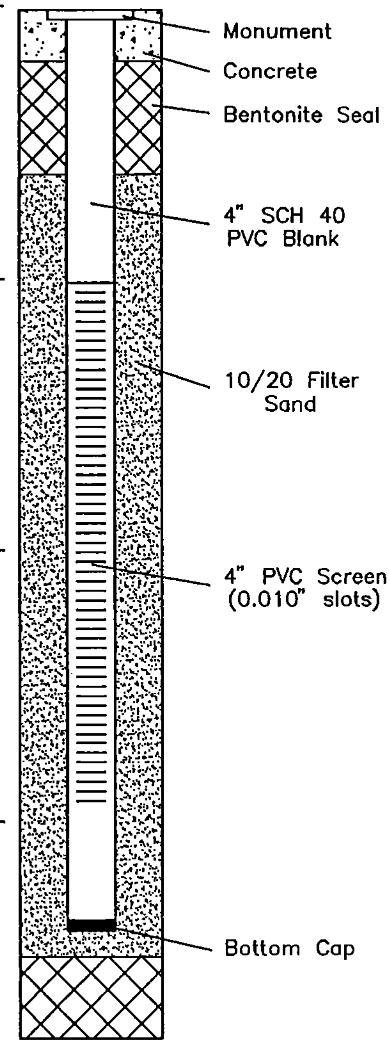
COMMENTS: SAMPLES COLLECTED USING 2" I.D. SPLIT SPOON SAMPLER LINED WITH BRASS SLEEVES

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading (ppm)
2/3/3/2	5–7	5
2/1/2/2	8–10	4
3/4/9/10	13–15	1210
1/2/2/3	15–17	220
5/8/12/17	19–21	3

Depth Below Surface, feet	Lithologic Description	Unified Soil Classification
0	6" Concrete	
	Sand, light brown, very fine grained, moist, loose	SP
	Silt, light brown, soft, wet	ML
	Silty Sand, brown, very fine grained, loose, wet to saturated	SM
	Sandy Silt, gray and black, medium stiff, wet, strong hydrocarbon odor	ML
15	Silty Sand, brownish gray, very fine grained, loose, wet, slight hydrocarbon odor	SM
	Sand, brown, fine grained, medium dense, moist to wet	SP

Boring terminated at 19 feet.
Sampler advanced to 21 feet
Groundwater encountered at approximately 9 feet during drilling.
Boring converted to a groundwater monitoring well on 7/19/93.

Well Construction Details



SECOR

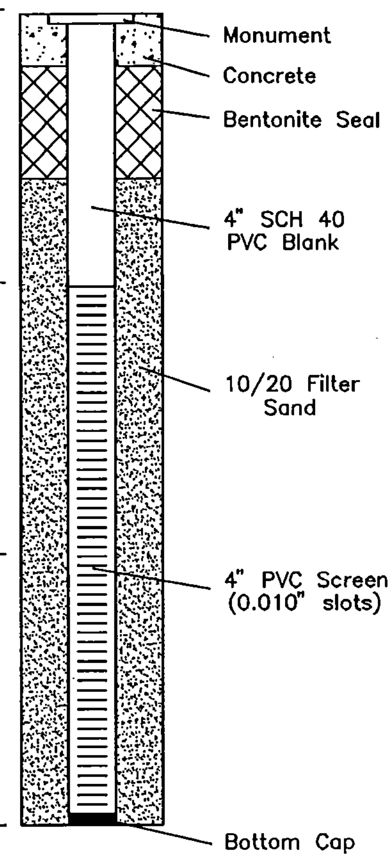
BORING LOG

BORING MW-6
PAGE 1 OF 1

PROJECT CASCADE NATURAL GAS/SUNNYSIDE
LOCATION 512 EAST DECATUR AVENUE SUNNYSIDE, WASHINGTON
SURFACE ELEVATION
CASING TOP ELEVATION 740.70**
START 7/20/93 1130
FINISH 7/20/93 1320
SAMPLER J. GIEBER
MONITORING DEVICE MICROTIP PID
SUBCONTRACTOR AND EQUIPMENT ENVIRONMENTAL WEST EXPLORATION, MOBILE B-61
COMMENTS SAMPLES COLLECTED USING 2" I.D. SPLIT SPOON SAMPLER LINED WITH BRASS SLEEVES

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading (ppm)	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification
			0	6" Concrete	
				Sand, light brown, very fine grained, moist, loose	SP
2/3/3/3		3	5		
				Silty Sand, light brown, very fine grained, loose, wet	SM
2/3/3/2		4			
			10	Saturated	
6/8/20/20		5		Grayish brown	
		4		Sandy Silt, grayish brown, stiff, moist	ML
5/5/14/14		2	15	Boring terminated at 15 feet. Sampler advanced to 17 feet Groundwater encountered at approximately 9 feet during drilling. Boring converted to a groundwater monitoring well on 7/20/93.	
			20		
			25		

Well Construction Details



**Note:
Casing top elevation datum established from U.S.C. & Gs. Brass disk in the northeast corner of City Hall building, having an elevation of 742.77 feet.

SECOR

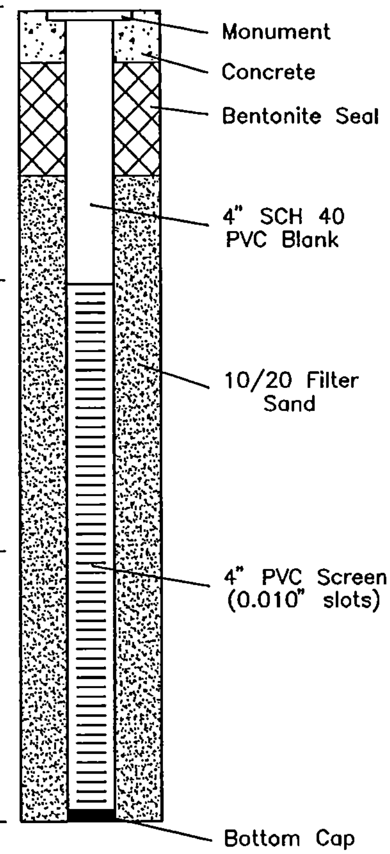
BORING LOG

BORING MW-7
PAGE 1 OF 1

PROJECT CASCADE NATURAL GAS/SUNNYSIDE
LOCATION 512 EAST DECATUR AVENUE SUNNYSIDE, WASHINGTON
SURFACE ELEVATION
CASING TOP ELEVATION 740.59**
START 7/20/93 1500
FINISH 7/20/93 11615
SAMPLER J. GIEBER
MONITORING DEVICE MICROTIP PID
SUBCONTRACTOR AND EQUIPMENT ENVIRONMENTAL WEST EXPLORATION, MOBILE B-61
COMMENTS SAMPLES COLLECTED USING 2" I.D. SPLIT SPOON SAMPLER LINED WITH BRASS SLEEVES

PENETRATION RESULTS BLOWS 6"/6"/6"	PID Reading (ppm)	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification
		0	8" Concrete 6" Crushed Aggregate	
			Sand, brown, fine grained, loose, moist.	SP
2/4/3/2	0	5		
			Silty Sand, brown, very fine grained, loose, wet	SM
2/2/2/2	0	10	Saturated	
5/8/10/14	0		Sandy Silt, gray, stiff, moist	ML
4/8/10/14	1	15	Sand, brown, fine grained, loose, wet	SP
			Boring terminated at 15 feet. Sampler advanced to 17 feet Groundwater encountered at approximately 9 feet during drilling. Boring converted to a groundwater monitoring well on 7/20/93.	
		20		
		25		

Well Construction Details



**Note: Casing top elevation datum established from U.S.C. & Gs. Brass disk in the northeast corner of City Hall building, having an elevation of 742.77 feet.

SECOR

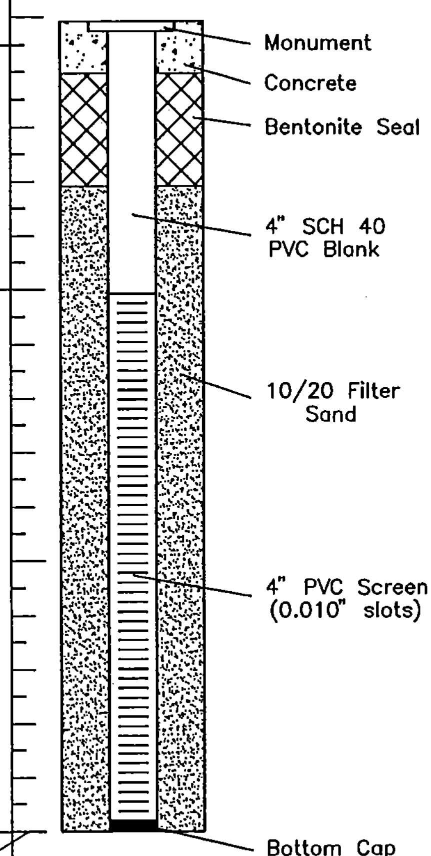
BORING LOG

BORING MW-8
PAGE 1 OF 1

PROJECT CASCADE NATURAL GAS/SUNNYSIDE
LOCATION 612 EAST DECATUR AVENUE SUNNYSIDE, WASHINGTON
SURFACE ELEVATION
CASING TOP ELEVATION 741.00**
START 7/20/93 0845
FINISH 7/20/93 1030
SAMPLER J. GIEBER
MONITORING DEVICE MICROTIP PID
SUBCONTRACTOR AND EQUIPMENT ENVIRONMENTAL WEST EXPLORATION, MOBILE B-61
COMMENTS SAMPLES COLLECTED USING 2" I.D. SPLIT SPOON SAMPLER LINED WITH BRASS SLEEVES

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading (ppm)	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification
			0	8" Concrete	
				Sand, light brown, fine grained, loose, moist	SP
1/2/2/3		2	5	Silty Sand, light brown, very fine grained, loose, wet	SM
2/2/3/3		10	10	Saturated	
7/10/4/5		2			
3/9/12/13		3	15	Sand, brown, fine grained, medium dense, saturated	SP
				Boring terminated at 15 feet. Sampler advanced to 17 feet Groundwater encountered at approximately 9 feet during drilling. Boring converted to a groundwater monitoring well on 7/20/93.	
			20		
			25		

Well Construction Details



**Note:
Casing top elevation datum established from U.S.C. & Gs. Brass disk in the northeast corner of City Hall building, having an elevation of 742.77 feet.

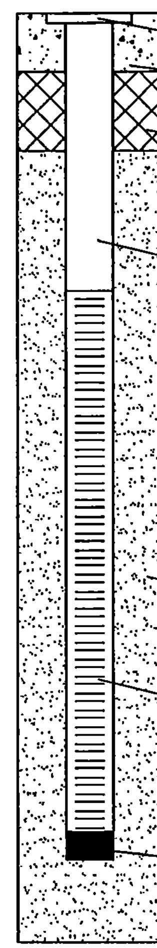
SEACOR BORING LOG

BORING MW-9
PAGE 1 OF 1

PROJECT CASCADE NATURAL GAS/SUNNYSIDE
LOCATION 512 EAST DECATUR AVENUE SUNNYSIDE, WASHINGTON
SURFACE ELEVATION --
CASING TOP ELEVATION 742.37**
START 0835 7/15/94
FINISH 1010 7/15/94
SAMPLER C. GODDARD
MONITORING DEVICE MICROTIP PID
SUBCONTRACTOR AND EQUIPMENT ENVIRONMENTAL WEST EXPLORATION;SCHRAMM T300E; 10.25OD HSA
COMMENTS SAMPLED AT 5, 10, AND 17 FEET USING A 2.5" O.D. X 24" LONG SPLIT SPOON SAMPLER LINED WITH 6" LONG BRASS TUBE SAMPLING RINGS. ECOLOGY WELL ABJ 974

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading (ppm)	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification
			0	Asphalt	
	GRAB	231		Sand with trace Silt, Yellowish brown, (10YR 5/4), fine to very fine grained, very loose, moist	SP
	COMPOSITE GRAB	94.7			
3/2/2/4		86.0	5	Wet	
		53.5		Sandy Silt, Dark brown, (10YR 3/3), Very fine grained sand, Silt, very soft, non-plastic	ML
1/1/1/4		10.3	10	Silt and trace Sand, Olive gray, (5Y 5/2), very soft, non-plastic, saturated	ML
			15	Sand with trace Silt, Very dark grayish brown, (2.5Y 3/2), Fine to very fine grained sand, mottled gray.	SP
3/8/20/40		13.3			
		14.1		Silty Sand, Very dark grayish brown, (2.5Y 3/2), Fine to very fine grained sand, some organics, stringers of white ash at 19 feet	SM
			20	Boring terminated at 17 feet. Sampler advanced to 19.0 feet. Groundwater encountered at approximately 5.5 feet during drilling. Boring converted to a groundwater monitoring well on 7/15/94.	
			25		

Well Construction Details



**Note:
Casing top elevation Datum established from U.S.C. & Gs. Brass disk in the northeast corner of City Hall building having an elevation of 742.77 feet.

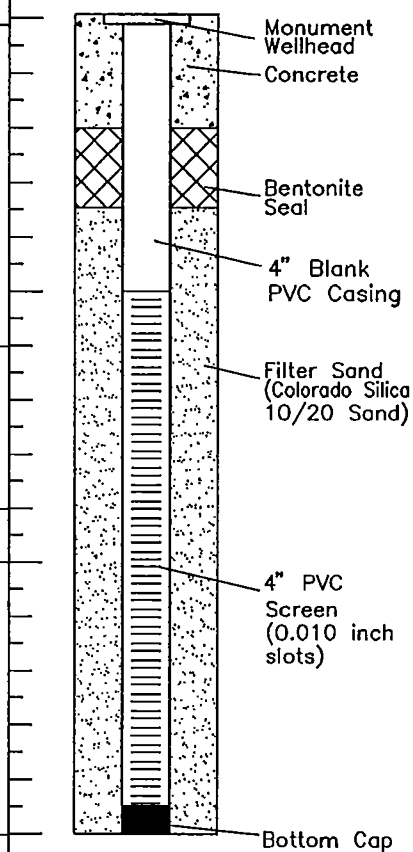
SEACOR — BORING LOG

BORING MW-10
PAGE 1 OF 1

PROJECT CASCADE NATURAL GAS/SUNNYSIDE — LOCATION 512 EAST DECATUR AVENUE SUNNYSIDE, WASHINGTON
SURFACE ELEVATION -- — CASING TOP ELEVATION 741.32**
START 1126 7/15/94 — FINISH 1240 7/15/94
SAMPLER C. GODDARD — MONITORING DEVICE MICROTIP PID
SUBCONTRACTOR AND EQUIPMENT ENVIRONMENTAL WEST EXPLORATION;SCHRAMM T300E; 10.25OD HSA
COMMENTS SAMPLED AT 4, 9, AND 15 FEET USING A 2.5" O.D. X 24" LONG SPLIT SPOON SAMPLER LINED WITH 6" LONG BRASS TUBE SAMPLING RINGS. ECOLOGY WELL ABJ 975

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading (ppm)	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification
			0	Concrete sidewalk	
	GRAB	35.1		Sand with trace Silt, Olive brown, (2.5Y 4/3), fine to very fine grained, very loose, moist.	SP
4/4/3/2		104	5	Wet with little silt	
				Silt with trace Clay, Dark olive brown, (2.5Y 3/3), very soft, non plastic	ML
2/3/3/10		129		Sand with trace Silt, Very dark grayish brown, (10Y 3/2), very fine grained, medium dense, saturated, stringers; gray (10Y 6/1), sharp contact	SP
			10	Silt with trace of Sand, Dark brown, (10y 3/3), soft, non plastic	ML
4/7/12/20		44.6	15	Sand, Black, (5Y 2.5/1), Medium to fine grained, dense	SP
				Silt with little Clay, Dark brown, (10y 4/3), very soft, non plastic, stringers, light gray (10y 7/1), ash	ML
				Boring terminated at 15 feet. Sampler advanced to 17.0 feet. Groundwater encountered at approximately 5.25 feet during drilling. Boring converted to a groundwater monitoring well on 7/15/94.	
			20		
			25		

Well Construction Details



**Note:
Casing top elevation datum established from USC and GS brass disk in the north-east corner of the City Hall building having an elevation of 742.77 feet.

00058-019-02

CNG1901L

SEACOR

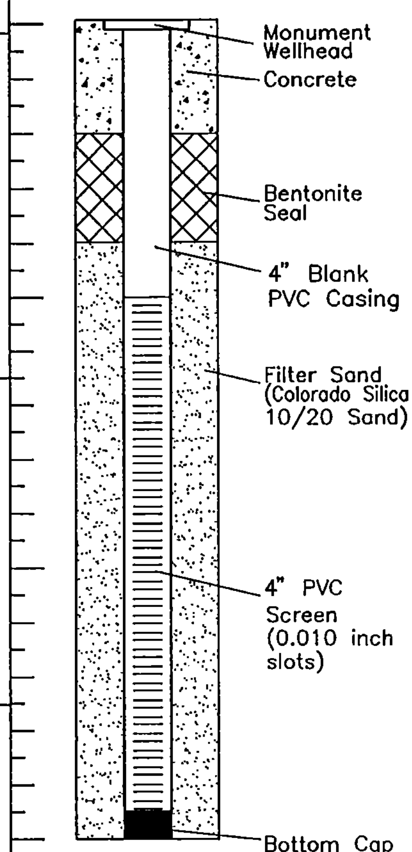
BORING LOG

BORING **MW-11**
PAGE **1** OF **1**

PROJECT **CASCADE NATURAL GAS/SUNNYSIDE** LOCATION **612 EAST DECATUR AVENUE SUNNYSIDE, WASHINGTON**
SURFACE ELEVATION **--** CASING TOP ELEVATION **741.47****
START **1428 7/15/94** FINISH **1507 7/15/94**
SAMPLER **C. GODDARD** MONITORING DEVICE **MICROTIP PID**
SUBCONTRACTOR AND EQUIPMENT **ENVIRONMENTAL WEST EXPLORATION;SCHRAMM T300E; 10.25OD HSA**
COMMENTS **SAMPLED AT 4, 6, 10, AND 15 FEET USING A 2.5" O.D. X 24" LONG SPLIT SPOON SAMPLER LINED WITH 6" LONG BRASS TUBE SAMPLING RINGS. ECOLOGY WELL ABJ 976**

PENETRATION RESULTS BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading (ppm)	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification
			0	Concrete sidewalk	
				Sand with trace Silt, Dark brown, (7.5Y 4/3), fine grained, loose, moist	SP
	GRAB	33.4			
7/7/6/5		45.5			
			5	Organics	
3/2/3/3		36.6			
				Silt with little Clay, Dark brown, (10Y 4/3), Very soft, non plastic Wet.	ML
5/7/13/17		29.8	10		
				Sand with trace Silt, Black, (10Y 2/1), medium grained, saturated.	SM
6/20/35/34		25.7	15		
				Silt with trace Sand, Very dark grayish brown, (10Y 3/2), soft, non plastic.	ML
				Boring terminated at 15 feet. Sampler advanced to 17.0 feet. Groundwater encountered at approximately 7.5 feet during drilling. Boring converted to a groundwater monitoring well on 7/15/94.	
			20		
			25		

Well Construction Details



**Note:
Casing top elevation datum established from USC and GS brass disk in the north-east corner of the City Hall building having an elevation of 742.77 feet.

APPENDIX C
LABORATORY REPORTS
AND CHAIN-OF-CUSTODY FORMS

JULY 1991
UST OVEREXCAVATION

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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

July 16, 1991

CASE NARRATIVE
Lab No. 18532

The samples in this batch showed both gasoline and diesel contamination. The gasoline present was heavily aged and weathered, causing a marked decrease in the light aromatic content in the samples, especially in benzene, toluene, and ethyl benzene. Some of the increase in gasoline content may also be due to the fact that by the methods used in the analysis, TPH-G, TPH-D, and 8015 modified, there is an overlap of compounds found in both diesel and gasoline, so diesel contaminated soils will show some gasoline contamination, while showing little or no aromatic content.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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

Report To: Seacor

Date: July 16, 1991

Report On: Analysis of Soil and Water

Lab No.: 18532

IDENTIFICATION:

Samples Received on 07-05-91

Project: 00058-014-01 CNG/Sunnyside

ANALYSIS:

Lab Sample No.	1	2	3	4
Client Identification	1 @ 1.1 Pile A	2 @ 1.9 Pile A	3 @ 1.8 Pile A	4 @ 2.3 Pile A
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Benzene	< 0.05	< 0.05	< 0.05	< 0.05
Toluene	< 0.05	< 0.05	< 0.05	< 0.05
Ethyl Benzene	< 0.05	< 0.05	< 0.05	< 0.05
Xylenes	0.15	0.07	< 0.05	< 0.05
SW-846 Method 8020				
Total Petroleum Fuel Hydrocarbons	45	95	29	36
TPH as	Gasoline	Gasoline	Gasoline	Gasoline

Note - Results reported on an as received basis.

Samples were analyzed for BTEX in accordance with SW-846 Method 8020 and for TPH by Modified 8015, using purge and trap techniques which can only detect gasoline (Method 5030).

SURROGATE RECOVERY, %

Lab Sample No.	1	2	3	4
BTEX-Trifluorotoluene	90	90	88	89
WTPH-G-Trifluorotoluene	117	115	98	124

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	5	6	7	8
Client Identification	5 @ 8.5 Pile A	6 @ 0.7 Pile A	7 @ 5.2 Pile A	8 @ 5.2 Pile A
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Benzene	0.15	< 0.05	0.56	< 0.05
Toluene	1.1	< 0.05	3.3	< 0.05
Ethyl Benzene	8.2	< 0.05	16	< 0.05
Xylenes	19	0.27	37	0.07
SW-846 Method 8020				
Total Petroleum Fuel Hydrocarbons	2,600	191	5,900	39
TPH as	Gasoline	Gasoline	Gasoline	Gasoline

Note - Results reported on an as received basis.

Samples were analyzed for BTEX in accordance with SW-846 Method 8020 and for TPH by Modified 8015, using purge and trap techniques which can only detect gasoline (Method 5030).

SURROGATE RECOVERY, %

Lab Sample No.	5	6	7	8
BTEX-Trifluorotoluene	108	89	83	91
WTPH-G-Trifluorotoluene	394*	116	1,194*	120

* Surrogate recoveries invalid due to matrix interference.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	9	10	11	12
Client Identification	9 @ 7.4 Pile A	10 @ 1.0 Pile A	11 @ 0.3 Pile A	12 @ 0.7 Pile A
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Benzene	< 0.05	0.13	< 0.05	< 0.05
Toluene	0.55	0.42	< 0.05	< 0.05
Ethyl Benzene	6.8	1.7	< 0.05	< 0.05
Xylenes	20	6.5	< 0.05	< 0.05
SW-846 Method 8020				
Total Petroleum Fuel Hydrocarbons	2,300	1,100	64	102
TPH as	Gasoline	Gasoline	Gasoline	Gasoline

Note - Results reported on an as received basis.

Samples were analyzed for BTEX in accordance with SW-846 Method 8020 and for TPH by Modified 8015, using purge and trap techniques which can only detect gasoline (Method 5030).

SURROGATE RECOVERY, %

Lab Sample No.	9	10	11	12
BTEX-Trifluorotoluene	108	102	90	91
WTPH-G-Trifluorotoluene	212*	218*	118	117

* Surrogate recovery invalid due to matrix interference.

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	13	14	15	16
Client Identification	13 @ 1.8 Pile A	14 @ 4.1 Pile A	15 @ 1.2 Pile A	17 @ 5.2 Pile A
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Benzene	< 0.05	< 0.05	< 0.05	< 0.05
Toluene	< 0.05	0.10	< 0.05	0.09
Ethyl Benzene	< 0.05	0.52	< 0.05	1.5
Xylenes	< 0.05	2.2	0.06	7.5
SW-846 Method 8020				
Total Petroleum Fuel Hydrocarbons	142	500	245	1,400
TPH as	Gasoline	Gasoline	Gasoline	Gasoline

Note - Results reported on an as received basis.

Samples were analyzed for BTEX in accordance with SW-846 Method 8020 and for TPH by Modified 8015, using purge and trap techniques which can only detect gasoline (Method 5030).

SURROGATE RECOVERY, %

Lab Sample No.	13	14	15	16
BTEX-Trifluorotoluene	90	90	88	86
WTPH-G-Trifluorotoluene	124	138	116	122

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	17	18	19	20
Client Identification	18 @ 0.5 Pile A	19 @ 2.6 Pile A	20 @ 6.5 Pile A	21 @ 0.9 Pile A
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Benzene	0.06	< 0.05	0.11	0.15
Toluene	0.13	< 0.05	0.38	0.84
Ethyl Benzene	0.29	0.23	2.4	2.5
Xylenes	1.4	1.0	7.6	8.9
SW-846 Method 8020				
Total Petroleum Fuel Hydrocarbons	300	290	1,500	1,500
TPH as	Gasoline	Gasoline	Gasoline	Gasoline

Note - Results reported on an as received basis.

Samples were analyzed for BTEX in accordance with SW-846 Method 8020 and for TPH by Modified 8015, using purge and trap techniques which can only detect gasoline (Method 5030).

SURROGATE RECOVERY, %

Lab Sample No.	17	18	19	20
BTEX-Trifluorotoluene	91	88	102	98
WTPH-G-Trifluorotoluene	160*	160*	240*	386*

* Surrogate recoveries invlaid due to matrix interference.

Continued . . . . .

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	21	22	23	24
Client Identification	22 @ 1.0 Pile A	23 @ 2.4 Pile A	24 @ 1.0 Pile A	25 @ 0.8 Pile A
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Benzene	< 0.05	< 0.05	< 0.05	< 0.05
Toluene	0.20	0.052	< 0.05	0.059
Ethyl Benzene	< 0.05	< 0.05	0.26	< 0.05
Xylenes	1.2	< 0.05	0.88	0.77
SW-846 Method 8020				
Total Petroleum Fuel Hydrocarbons	90	3.4	10	64
TPH as	Gasoline	Gasoline	Gasoline	Gasoline

Note - Results reported on an as received basis.

Samples were analyzed for BTEX in accordance with SW-846 Method 8020 and for TPH by Modified 8015, using purge and trap techniques which can only detect gasoline (Method 5030).

SURROGATE RECOVERY, %

Lab Sample No.	21	22	23	24
BTEX-Trifluorotoluene	82	86	93	86
WTPH-G-Trifluorotoluene	69	82	67	81

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	25	26	27	28
Client Identification	26 @ 1.0 Pile A	27 @ 1.8 Pile A	28 @ 6.8 Pile A	1 @ 2.0 Pile B
Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Benzene	< 0.05	< 0.05	0.32	< 0.05
Toluene	0.12	0.54	2.4	0.10
Ethyl Benzene	0.14	16	13	< 0.05
Xylenes	0.79	7.9	28	0.37
SW-846 Method 8020				
Total Petroleum Fuel Hydrocarbons	2.4	1,300	2,800	100
TPH as	Gasoline	Gasoline	Gasoline	Gasoline

Note - Results reported on an as received basis.

Samples were analyzed for BTEX in accordance with SW-846 Method 8020 and for TPH by Modified 8015, using purge and trap techniques which can only detect gasoline (Method 5030).

SURROGATE RECOVERY, %

Lab Sample No.	25	26	27	28
BTEX-Trifluorotoluene	93	93	83	86
WTPH-G-Trifluorotoluene	70	67	71	68

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	29	30	31	32
Client Identification	2 @ 0.8 Pile B	3 @ 7.0 Pile B	4 @ 3.3 Pile B	5 @ 1.0 Pile B
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Benzene	0.05	< 0.05	< 0.05	< 0.05
Toluene	0.81	0.68	0.073	0.73
Ethyl Benzene	< 0.05	5.4	0.23	0.59
Xylenes	0.19	19	1.6	1.2
SW-846 Method 8020				
Total Petroleum Fuel Hydrocarbons	13	1,800	320	310
TPH as	Gasoline	Gasoline	Gasoline	Gasoline

Note - Results reported on an as received basis.

Samples were analyzed for BTEX in accordance with SW-846 Method 8020 and for TPH by Modified 8015, using purge and trap techniques which can only detect gasoline (Method 5030).

SURROGATE RECOVERY, %

Lab Sample No.	29	30	31	32
BTEX-Trifluorotoluene	102	102	79	94
WTPH-G-Trifluorotoluene	84	78	81	75

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	33	34	35	36
Client Identification	6 @ 2.6 Pile B	7 @ 3.9 Pile B	8 @ 0.5 Pile B	9 @ 2.3 Pile B
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Benzene	< 0.05	< 0.05	< 0.05	< 0.05
Toluene	0.12	0.91	< 0.05	0.58
Ethyl Benzene	0.92	6.0	< 0.05	5.3
Xylenes	0.60	17	0.05	27
SW-846 Method 8020				
Total Petroleum Fuel Hydrocarbons	10	1,600	12	1,800
TPH as	Gasoline	Gasoline	Gasoline	Gasoline

Note - Results reported on an as received basis.

Samples were analyzed for BTEX in accordance with SW-846 Method 8020 and for TPH by Modified 8015, using purge and trap techniques which can only detect gasoline (Method 5030).

SURROGATE RECOVERY, %

Lab Sample No.	33	34	35	36
BTEX-Trifluorotoluene	69	104	95	72
WTPH-G-Trifluorotoluene	106	119	70	85

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

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Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	37	38	39	40
Client Identification	10 @ 0.5 Pile B	11 @ 2.4 Pile B	12 @ 7.3 Pile B	MW-1
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Water mg/l
Benzene	< 0.05	< 0.05	< 0.05	< 0.001
Toluene	0.22	< 0.05	0.41	< 0.001
Ethyl Benzene	2.1	0.56	1.8	< 0.001
Xylenes	8.4	0.22	5.1	< 0.001
SW-846 Method 8020				
Total Petroleum Fuel Hydrocarbons	600	43	490	0.130 ppb
TPH as	Gasoline	Gasoline	Gasoline	Gasoline

Note - Soil results reported on an as received basis.

Samples were analyzed for BTEX in accordance with SW-846 Method 8020 and for TPH by Modified 8015, using purge and trap techniques which can only detect gasoline (Method 5030).

SURROGATE RECOVERY, %

Lab Sample No.	37	38	39	40
BTEX-Trifluorotoluene	90	91	101	80
WTPH-G-Trifluorotoluene	78	70	98	63

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Lab Sample No.	41	42	43	44
Client Identification	MW-2	MW-3	EX-Pond #1	EX-Pond #2
Matrix/Units	Water mg/l	Water mg/l	Water mg/l	Water mg/l
Benzene	< 0.001	29	< 0.001	< 0.001
Toluene	< 0.001	3.8	< 0.001	< 0.001
Ethyl Benzene	< 0.001	0.41	< 0.001	< 0.001
Xylenes	< 0.001	0.31	< 0.001	< 0.001
SW-846 Method 8020				
Total Petroleum Fuel Hydrocarbons	0.15	1,800	< 0.1	< 0.1
TPH as	Gasoline	Gasoline	Gasoline	Gasoline

Samples were analyzed for BTEX in accordance with SW-846 Method 8020 and for TPH by Modified 8015, using purge and trap techniques which can only detect gasoline (Method 5030).

SURROGATE RECOVERY, %

Lab Sample No.	41	42	43	44
BTEX-Trifluorotoluene	91	86	92	91
WTPH-G-Trifluorotoluene	62	71	69	65

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Lab Sample No.	1	2	3	4
Client Identification	1 @ 1.1 Pile A	2 @ 1.9 Pile A	3 @ 1.8 Pile A	4 @ 2.3 Pile A
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	300	430	74	29
TPH as	Diesel/ Heavy Oil	Diesel	Diesel	Diesel

SURROGATE RECOVERY, %

Lab Sample No.	1	2	3	4
TPH by Mod 8015				
1-Chlorooctane	103	112	108	108
Perylene	103	108	106	104

Note - Soil results reported on an as received basis.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	5	6	7	8
Client Identification	5 @ 8.5 Pile A	6 @ 0.7 Pile A	7 @ 5.2 Pile A	8 @ 5.2 Pile A
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	560	390	1,200	45
TPH as	Diesel	Diesel	Diesel	Diesel

Surrogate Recovery, %

Lab Sample No.	5	6	7	8
TPH by Mod 8015				
1-Chlorooctane	198*	156*	265*	108
Perylene	112	111	108	108

* Surrogate recoveries invalid due to matrix interference.

Note - Soil Results reported on an as received basis.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	9	10	11	12
Client Identification	9 @ 7.4 Pile A	10 @ 1.0 Pile A	11 @ 0.3 Pile A	12 @ 0.7 Pile A
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	2,400	980	68	240
TPH as	Diesel	Heavy Oil Diesel	Diesel	Diesel

SURROGATE RECOVERY, %

Lab Sample No.	9	10	11	12
TPH by Mod 8015				
1-Chlorooctane	187*	123	114	110
Perylene	109	117	113	110

* Surrogate recoveries invalid due to matrix interference.

Note - Soil Results reported on an as received basis.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	13	14	15	16
Client Identification	13 @ 1.8 Pile A	14 @ 4.1 Pile A	15 @ 1.2 Pile A	17 @ 5.2 Pile A
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	700	350	860	1,400
TPH as	Diesel	Diesel	Diesel	Heavy Oil Diesel

SURROGATE RECOVERY, %

Lab Sample No.	13	14	15	16
TPH by Mod 8015				
1-Chlorooctane	109	147	116	178*
Perylene	107	108	109	117

* Surrogate recoveries invalid due to matrix interference.

Note - Soil Results reported on an as received basis.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	17	18	19	20
Client Identification	18 @ 0.5 Pile A	19 @ 2.6 Pile A	20 @ 6.5 Pile A	21 @ 0.9 Pile A
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	170	150	500	730
TPH as	Diesel	Diesel	Diesel	Diesel

SURROGATE RECOVERY, %

Lab Sample No.	17	18	19	20
TPH by Mod 8015				
1-Chlorooctane	113	132	212*	178*
Perylene	111	110	103	107

* Surrogate recoveries invalid due to matrix interference.

Note - Soil Results reported on an as received basis.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	21	22	23	24
Client Identification	22 @ 1.0 Pile A	23 @ 2.4 Pile A	24 @ 1.0 Pile A	25 @ 0.8 Pile A
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	330	32	130	140
TPH as	Diesel	Diesel	Diesel	Diesel

SURROGATE RECOVERY, %

Lab Sample No.	21	22	23	24
TPH by Mod 8015				
1-Chlorooctane	122	104	106	109
Perylene	102	103	101	102

Note - Soil Results reported on an as received basis.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	25	26	27	28
Client Identification	26 @ 1.0 Pile A	27 @ 1.8 Pile A	28 @ 6.8 Pile A	1 @ 2.0 Pile B
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	37	3,900	1,500	1,300
TPH as	Diesel	Heavy Oil Diesel	Diesel	Diesel

SURROGATE RECOVERY, %

Lab Sample No.	25	26	27	28
TPH by Mod 8015				
1-Chlorooctane	112	182*	231*	109
Perylene	108	106	106	103

* Surrogate recovery invalid due to matrix interference.

Note - Soil Results reported on an as received basis.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	29	30	31	32
Client Identification	2 @ 0.8 Pile B	3 @ 7.0 Pile B	4 @ 3.3 Pile B	5 @ 1.0 Pile B
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	68	920	210	390
TPH as	Diesel	Diesel	Diesel	Diesel

SURROGATE RECOVERY, %

Lab Sample No.	29	30	31	32
TPH by Mod 8015				
1-Chlorooctane	114	244*	147	271*
Perylene	104	103	103	102

* Surrogate recoveries invalid due to matrix interference.

Note - Soil Results reported on an as received basis.

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	33	34	35	36
Client Identification	6 @ 2.6	7 @ 3.9	8 @ 0.5	9 @ 2.3
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Soil mg/kg
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	93	800	< 10.0	2,100
TPH as	Heavy Oil Diesel	Diesel		Diesel

SURROGATE RECOVERY, %

Lab Sample No.	33	34	35	36
TPH by Mod 8015				
1-Chlorooctane	106	251*	110	272*
Perylene	113	107	106	106

* Surrogate recoveries invalid due to matrix interference.

Note - Soil Results reported on an as received basis.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	37	38	39	40
Client Identification	10 @ 0.5 Pile B	11 @ 2.4 Pile B	12 @ 7.3 Pile B	MW-1
Matrix/Units	Soil mg/kg	Soil mg/kg	Soil mg/kg	Water mg/l
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	3,000	150	150	< 1.0
TPH as	Diesel	Diesel	Diesel	

SURROGATE RECOVERY, %

Lab Sample No.	37	38	39	40
TPH by Mod 8015				
1-Chlorooctane	145	114	124	63
Perylene	103	105	104	115

Note - Soil Results reported on an as received basis.

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	41	42	43	44
Client Identification	MW-2	MW-3	Ex-Pond #1	Ex-Pond #2
Matrix/Units	Water mg/l	Water mg/l	Water mg/l	Water mg/l
Total Petroleum Fuel Hydrocarbons by EPA SW-846 Modified Method 8015	< 1.0	4.2	< 1.0	1.7
TPH as		Diesel		Diesel

SURROGATE RECOVERY, %

Lab Sample No.	41	42	43	44
TPH by Mod 8015				
1-Chlorooctane	78	98	85	80
Perylene	118	117	119	123

Note - Soil Results reported on an as received basis.

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01

Lab No. 18532
July 16, 1991

Lab Sample No.	Client ID	Pentachlorophenol, mg/kg
2	2 @ 1.9 Pile A	< 0.01
5	5 @ 8.5 Pile A	0.030
6	6 @ 0.7 Pile A	< 0.01
8	8 @ 5.2 Pile A	< 0.01
9	9 @ 7.4 Pile A	< 0.01
18	19 @ 2.6 Pile A	< 0.01
19	20 @ 6.5 Pile A	< 0.01
30	3 @ 7.0 Pile B	< 0.01
32	5 @ 1.0 Pile B	< 0.01
36	9 @ 2.3 Pile B	< 0.01

Phenols by EPA SW-846 Method 8040

Note - Soil matrix for all samples tested for pentachlorophenol.

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01
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Lab No. 18532
July 16, 1991
Revised: February 11, 1992

Lab Sample No.	40	41	42
Client Identification	MW-1	MW-2	MW-3
Matrix/Units	Water mg/l	Water mg/l	Water mg/l
Halogenated Volatiles Per EPA SW-846 Method 8010.			
Vinyl Chloride	< 0.005	< 0.005	< 0.005
Methylene chloride	< 0.001	< 0.001	< 0.001
1,1-dichloroethylene	< 0.001	< 0.001	< 0.001
1,1-dichloroethane	< 0.001	< 0.001	< 0.001
1,2-transdichloroethylene	< 0.001	< 0.001	< 0.001
1,2-dichloroethane	0.11	< 0.001	0.46
Chloroform	< 0.001	< 0.001	< 0.001
1,1,1-trichloroethane	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	< 0.001	< 0.001	< 0.001
1,2-dichloropropane	< 0.001	< 0.001	< 0.001
Bromodichloromethane	< 0.001	< 0.001	< 0.001
Trans-1,3-dichloropropene	< 0.001	< 0.001	< 0.001
Trichloroethylene	< 0.001	< 0.001	< 0.001
Cis-1,3-dichloropropene	< 0.001	< 0.001	< 0.001
1,1,2-trichloroethane	< 0.001	< 0.001	< 0.001
Tetrachloroethylene	< 0.001	< 0.001	< 0.001
Chlorodibromomethane	< 0.001	< 0.001	< 0.001
1,1,2,2-tetrachloroethane	< 0.001	< 0.001	< 0.001
Bromoform	< 0.001	< 0.001	< 0.001
Chlorobenzene	< 0.001	< 0.001	< 0.001
1,2 Dichlorobenzene	< 0.001	< 0.001	< 0.001
1,3 Dichlorobenzene	< 0.001	< 0.001	< 0.001
1,4 Dichlorobenzene	< 0.001	< 0.001	< 0.001

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Seacor
Project: 00058-014-01
Page 25 of 25
Lab No. 18532
July 16, 1991

Lab Sample No.	43	44
Client Identification	Ex-Pond #1	Ex-Pond #2
Matrix/Units	Water mg/l	Water mg/l
Halogenated Volatiles Per EPA SW-846 Method 8010.		
Vinyl Chloride	< 0.005	< 0.005
Methylene chloride	< 0.001	< 0.001
1,1-dichloroethylene	< 0.001	< 0.001
1,1-dichloroethane	< 0.001	< 0.001
1,2-transdichloroethylene	< 0.001	< 0.001
1,2-dichloroethane	< 0.001	0.001
Chloroform	< 0.001	< 0.001
1,1,1-trichloroethane	< 0.001	< 0.001
Carbon Tetrachloride	< 0.001	< 0.001
1,2-dichloropropane	< 0.001	< 0.001
Bromodichloromethane	< 0.001	< 0.001
Trans-1,3-dichloropropene	< 0.001	< 0.001
Trichloroethylene	< 0.001	< 0.001
Cis-1,3-dichloropropene	< 0.001	< 0.001
1,1,2-trichloroethane	< 0.001	< 0.001
Tetrachloroethylene	< 0.001	< 0.001
Chlorodibromomethane	< 0.001	< 0.001
1,1,2,2-tetrachloroethane	< 0.001	< 0.001
Bromoform	< 0.001	< 0.001
Chlorobenzene	< 0.001	< 0.001
1,2 Dichlorobenzene	< 0.001	< 0.001
1,3 Dichlorobenzene	< 0.001	< 0.001
1,4 Dichlorobenzene	< 0.001	< 0.001

SOUND ANALYTICAL SERVICES

C LARRY ZURAW

SOUND ANALYTICAL SERVICES, INC.
ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX (206) 922-5047

CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: SEACOR

PROJECT NAME: CNG/Sunnyside (Pile A) 00058-014-01

CONTACT: PAUL SCHMIDT

PHONE NO: 646-0280

ANALYSIS REQUESTED: (Circle, check box or write preferred method in box) OTHER:

SAMPLE ID #	DATE	TIME	PRES.	MATRIX	BTEX	TPH 418.1	TPH Mod 8015 Diesel	BTEX/8015 Combo Gasoline Only	Halogenated Volatiles EPA 601/8010	Aromatics EPA 602/8020	PAH EPA 625/8270	Purgeables (GC/MS) EPA 624/8240	BNA's EPA 625/8270	Organochlorine Pest., PCB's EPA 608/8080	Total Halogens EPA 9076	TCLP Extraction Metals	TCLP Extraction (ZHE) Volatile Organics	TCLP Extraction Semi-volatiles	TCLP Extraction Pesticides & Herbicides	Total Metals ICP GFAA	Pentachlorophenol
1. 1@ 1.1	7-2	1354		Soil			✓	✓													
2. 2@ 1.9	"	1333		"			✓	✓													X
3. 3@ 1.8	"	1342		"			✓	✓													
4. 4@ 2.3	"	1410		"			✓	✓													
5. 5@ 8.5	"	1419		"			✓	✓													X
6. 6@ 0.7	"	1316		"			✓	✓													X
7. 7@ 5.2	"	1415		"			✓	✓													
8. 8@ 5.2	"	1400		"			✓	✓													X
9. 9@ 7.4	"	1432		"			✓	✓													X
10. 10@ 1.0	"	1308		"			✓	✓													
11. 11@ 0.3	"	1427		"			✓	✓													
12. 12@ 0.7	"	1304		"			✓	✓													

RELINQUISHED BY:	RELINQUISHED BY:	RELINQUISHED BY:
Signature: Paul Schmidt	Signature: [signature]	Signature:
Printed Name: PAUL SCHMIDT	Printed Name: PALMQUIST	Printed Name:
Firm: SEACOR	Firm: SAS	Firm:
Date/Time: 07-05-91 1100	Date/Time: 7-5-91 12:10	Date/Time:
RECEIVED BY:	**RECEIVED BY:**	**RECEIVED BY:**
Signature: [signature]	Signature: Giang	Signature:
Printed Name: PALMQUIST	Printed Name: S. GIANG	Printed Name:
Firm: S.A.S.	Firm: SAS	Firm:
Date/Time: 7-5-91 11:20	Date/Time: 7/5/91 1210 pm	Date/Time:

SPECIAL INSTRUCTIONS / COMMENTS:

Sheet 1 of 3

Per phone conversation w/ Paul Schmidt - the Penta's were marked per his request for testing. 7-8-91 12:50pm
by S. Giang
Sample manager
Sound Analytical

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX (206) 922-5047

CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: SEACOR

PROJECT NAME: CNG/Sunnyside (Pile A) 00058-014-01

CONTACT: PAUL SCHMIDT

PHONE NO: 646-0280

ANALYSIS REQUESTED: (Circle, check box or write preferred method in box) OTHER:

SAMPLE ID #	DATE	TIME	PRES.	MATRIX	BTEX	TPH 418.1	TPH Mod 8015 Diesel	BTEX/8015 Combo Gasoline Only	Halogenated Volatiles EPA 601/8010	Aromatics EPA 602/8020	PAH EPA 625/8270	Purgeables (GC/MS) EPA 624/8240	BNA's EPA 625/8270	Organochlorine Pest., PCB's EPA 608/8080	Total Halogens EPA 9076	TCLP Extraction Metals	TCLP Extraction (ZHE) Volatile Organics	TCLP Extraction Semi-volatiles	TCLP Extraction Pesticides & Herbicides	Total Metals ICP GFAA	Pentachlorophenol
1. 13 @ 1.8	7-2	1328		Soil			✓	✓													
2. 14 @ 4.1	"	1320		Soil			✓	✓													
3. 15 @ 1.2	"	1634		"			✓	✓													
4.																					
5. 17 @ 5.2	7-2	1717		Soil			✓	✓													
6. 18 @ 0.5	"	1643		"			✓	✓													
7. 19 @ 2.6	"	1712		"			✓	✓													X
8. 20 @ 6.5	"	1653		"			✓	✓													X
9. 21 @ 0.9	"	1637		"			✓	✓													
10. 22 @ 1.6	"	1735		"			✓	✓													
11. 23 @ 2.4	"	1732		"			✓	✓													
12. 24 @ 1.0	"	1650		"			✓	✓													

RELINQUISHED BY:	RELINQUISHED BY:	RELINQUISHED BY:
Signature: Paul Schmidt	Signature: [signature]	Signature:
Printed Name: PAUL SCHMIDT	Printed Name: PALMQUIST	Printed Name:
Firm: SEACOR	Firm: SAS	Firm:
Date/Time: 07-05-91 1100	Date/Time: 7-5-91 12:10	Date/Time:
RECEIVED BY:	**RECEIVED BY:**	**RECEIVED BY:**
Signature: [signature]	Signature: S Giang	Signature:
Printed Name: PALMQUIST	Printed Name: S Giang	Printed Name:
Firm: SAS	Firm: SAS	Firm:
Date/Time: 7-5-91-11:20	Date/Time: 7/5/91 1210	Date/Time:

SPECIAL INSTRUCTIONS / COMMENTS:

Sheet 2 of ~~2~~ 3

SOUND ANALYTICAL SERVICES, INC.

ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX (206) 922-5047

CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: SEACOR

PROJECT NAME: CNG / Sunnyside (Pile A) 00058-014-01

CONTACT: PAUL SCHMIDT

PHONE NO: 646-0280

ANALYSIS REQUESTED: (Circle, check box or write preferred method in box) OTHER:

SAMPLE ID #	DATE	TIME	PRES.	MATRIX	BTEX	TPH 418.1	TPH Mod 8015 Diesel	BTEX/8015 Combo Gasoline Only	Halogenated Volatiles EPA 601/8010	Aromatics EPA 602/8020	PAH EPA 625/8270	Purgeables (GC/MS) EPA 624/8240	BNA's EPA 625/8270	Organochlorine Pest., PCB's EPA 608/8080	Total Halogens EPA 9076	TCLP Extraction Metals	TCLP Extraction (ZHE) Volatile Organics	TCLP Extraction Semi-volatiles	TCLP Extraction Pesticides & Herbicides	Total Metals ICP GFAA	Pentachlorophenol						
1. 25@ 0.8	7-2	1703		Soil			✓	✓																			
2. 26@ 1.0	7-2	1738		"			✓	✓																			
3. 27@ 1.8	"	1656		"			✓	✓																			
4. 28@ 6.8	"	1659		"			✓	✓																			
5.																											
6.																											
7.																											
8.																											
9.																											
10.																											
11.																											
12.																											

RELINQUISHED BY:	RELINQUISHED BY:	RELINQUISHED BY:
Signature: Paul Schmidt	Signature: [illegible]	Signature:
Printed Name: PAUL SCHMIDT	Printed Name: PALMQUIST	Printed Name:
Firm: SEACOR	Firm: SAS	Firm:
Date/Time: 07-05-91 1100	Date/Time: 7-5-91 1340	Date/Time:

RECEIVED BY:	RECEIVED BY:	RECEIVED BY:
Signature: [illegible]	Signature: S Giang	Signature:
Printed Name: PALMQUIST	Printed Name: S Giang	Printed Name:
Firm: SAS	Firm: SAS	Firm:
Date/Time: 7-5- 11:20	Date/Time: 7/5/91 12:10	Date/Time:

SPECIAL INSTRUCTIONS / COMMENTS:

Sheet 3 of 3

SOUND ANALYTICAL SERVICES, INC.
ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX (206) 922-5047

CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: SEACOR
PROJECT NAME: CNG/Sunnyside (Pile B) 00058-014-01
CONTACT: PAUL SCHMIDT
PHONE NO: 646-0280

ANALYSIS REQUESTED: (Circle, check box or write preferred method in box) OTHER:

SAMPLE ID #	DATE	TIME	PRES.	MATRIX	BTEX	TPH 418.1	TPH Mod 8015 Diesel	BTEX/8015 Combo Gasoline Only	Halogenated Volatiles EPA 601/8010	Aromatics EPA 602/8020	PAH EPA 625/8270	Purgeables (GC/MS) EPA 624/8240	BNA's EPA 625/8270	Organochlorine Pest., PCB's EPA 608/8080	Total Halogens EPA 9076	TCLP Extraction Metals	TCLP Extraction (ZHE) Volatile Organics	TCLP Extraction Semi-volatiles	TCLP Extraction Pesticides & Herbicides	Total Metals ICP GFAA	Pentachlorophenol						
1. 1@2.0	7-3	1027		Soil			✓	✓																			
2. 2@0.8	"	1018		"			✓	✓																			
3. 3@7.0	"	1116		"			✓	✓													X						
4. 4@3.3	"	955		"			✓	✓																			
5. 5@1.0	"	945		"			✓	✓													X						
6. 6@2.6	"	938		"			✓	✓																			
7. 7@3.9	"	1119		"			✓	✓													~~X~~ NO						
8. 8@0.5	"	1003		"			✓	✓																			
9. 9@2.3	"	1035		"			✓	✓													X						
10. 10@0.5	"	1044		"			✓	✓																			
11. 11@2.4	"	0950		"			✓	✓																			
12. 12@7.3	"	1107		"			✓	✓																			

RELINQUISHED BY:	RELINQUISHED BY:	RELINQUISHED BY:
Signature: Paul Schmidt	Signature: [signature]	Signature:
Printed Name: PAUL SCHMIDT	Printed Name: ~~SAS~~ PALMQUIST	Printed Name:
Firm: SEACOR	Firm: SAS	Firm:
Date/Time: 07-05-91 1100	Date/Time: 7-5-91 12:10	Date/Time:
RECEIVED BY:	**RECEIVED BY:**	**RECEIVED BY:**
Signature: [signature]	Signature: S Giang	Signature:
Printed Name: PALMQUIST	Printed Name: S GIANG	Printed Name:
Firm: S.A.S.	Firm: SAS	Firm:
Date/Time: 7-5-11:20	Date/Time: 7/5/91 12:10	Date/Time:

SPECIAL INSTRUCTIONS / COMMENTS:
Sheet 1 of 1
NO Penta on # ~~7~~@3.9. S Giang 7-12-91 11:55am per Tom B.

SOUND ANALYTICAL SERVICES, INC.
ANALYTICAL & ENVIRONMENTAL CHEMISTS

4813 Pacific Hwy. East
Tacoma, Washington 98424
(206) 922-2310 • FAX (206) 922-5047

CHAIN OF CUSTODY / REQUEST FOR LABORATORY ANALYSIS

CLIENT: SEACOR

PROJECT NAME: CNG/Sunnyside
00058-014-01

CONTACT: PAUL SCHMIDT

PHONE NO: 646-0280

ANALYSIS REQUESTED: (Circle, check box or write preferred method in box) OTHER:

SAMPLE ID #	DATE	TIME	~~PRES.~~ containers	MATRIX	BTEX	TPH 418.1	TPH Mod 8015 Diesel	BTEX/8015 Combo Gasoline Only	Halogenated Volatiles EPA 601/8010	Aromatics EPA 602/8020	PAH EPA 625/8270	Purgeables (GC/MS) EPA 624/8240	BNA's EPA 625/8270	Organochlorine Pest., PCB's EPA 608/8080	Total Halogens EPA 9076	TCLP Extraction Metals	TCLP Extraction (ZHE) Volatile Organics	TCLP Extraction Semi-volatiles	TCLP Extraction Pesticides & Herbicides	Total Metals ICP GFAA	OTHER
1. MW-1	7-3	1241	1 l	H_2O			✓														
2. MW-1	7-3	1241	VOA	H_2O				✓	✓												
3. MW-2	7-3	1320	1 l	H_2O			✓														
4. MW-2	7-3	1320	VOA	H_2O				✓	✓												
5. MW-3	7-3	1340	1 l	H_2O			✓														
6. MW-3	7-3	1340	VOA	H_2O				✓	✓												
7.																					
8. Ex-Pond #1	7-3	1227	VOA					✓	✓												
9. "	"	"	1 l				✓														
10. Ex-Pond #2	7-3	1234	VOA					✓	✓												
11. "	"	"	1 l				✓														
12.																					

RELINQUISHED BY:	RELINQUISHED BY:	RELINQUISHED BY:
Signature: Paul Schmidt	Signature: JPalmquist	Signature:
Printed Name: PAUL SCHMIDT	Printed Name: PALMQUIST	Printed Name:
Firm: SEACOR	Firm: SAS	Firm:
Date/Time: 07-05-91 / 1100	Date/Time: 7-5-91 12:10	Date/Time:
RECEIVED BY:	**RECEIVED BY:**	**RECEIVED BY:**
Signature: Palmquist	Signature: SGiang	Signature:
Printed Name: PALMQUIST	Printed Name: SGiang	Printed Name:
Firm: S.A.S.	Firm: SAS	Firm:
Date/Time: 7-5 11:00AM	Date/Time: 7/5/91 12:10	Date/Time:

SPECIAL INSTRUCTIONS / COMMENTS:

Sheet 1 of 1

Per phone conversation with Paul Schmidt the above 8010's were marked for testing.
7-8-91 12:50pm
by S. Giang
Sample Manager
Sound Analytical

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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

ANALYTICAL NARRATIVE

TPH CHECKLIST
(5030)

Client: Seacor

Lab No.: 18532

Project Name: 000-58-014-01

Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS

Analyzed by: Dean Strom

Lab Number	1	2	3	4	5
Client ID	1 @ 1.1 Pile A	2 @ 1.9 Pile A	3 @ 1.8 Pile A	4 @ 2.3 Pile A	5 @ 5.2 Pile A
Date Sampled	7-2-91	7-2-91	7-2-91	7-2-91	7-2-91
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	7-5-91
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	7-8-91
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	7-15-91
Dilution Factor					
Sample Matrix	Soil	Soil	Soil	Soil	Soil
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
WTPH-G- Triflorotoluene	117	115	98	124	394*

Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.

Notes and Discussion:
Surrogate recovery invalid due to matrix interference.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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

ANALYTICAL NARRATIVE

TPH CHECKLIST
(5030)

Client: Seacor

Lab No.: 18532

Project Name: 000-58-014-01

Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS

Analyzed by: Dean Strom

Lab Number	6	7	8	9	10
Client ID	6 @ 0.7 Pile A	7@ 5.2 Pile A	8 @ 5.2 Pile A	9 @ 7.4 Pile A	10 @ 1.0 Pile A
Date Sampled	7-2-91	7-2-91	7-2-91	7-2-91	7-2-91
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	7-5-91
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	7-8-91
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	7-15-91
Dilution Factor					
Sample Matrix	Soil	Soil	Soil	Soil	Soil
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
WTPH-G- Trifluorotoluene	116	1,194*	120	212*	218*

Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.

Notes and Discussion:
Surrogate recoveries invalid dur to matrix interference.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS
4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

ANALYTICAL NARRATIVE

TPH CHECKLIST
(5030)

Client: Seacor

Lab No.: 18532

Project Name: 000-58-014-01

Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS

Analyzed by: Dean Strom

Lab Number	11	12	13	14	15
Client ID	11 @ 0.3 Pile A	12 @ 0.7 Pile A	13 @ 1.8 Pile A	14 @ 4.1 Pile A	15@ 1.2 Pile A
Date Sampled	7-2-91	7-2-91	7-2-91	7-2-91	7-2-91
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	7-5-91
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	7-8-91
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	7-15-91
Dilution Factor					
Sample Matrix	Soil	Soil	Soil	Soil	Soil
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
WTPH-G-Trifluorotoluene	118	117	124	138	116

Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.

Notes and Discussion:

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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

ANALYTICAL NARRATIVE

TPH CHECKLIST (5030)

Client: Seacor

Lab No.: 18532

Project Name: 000-58-014-01

Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS

Analyzed by: Dean Strom

Lab Number	16	17	18	19	20
Client ID	17 @ 5.2 Pile A	18 @ 0.5 Pile A	19 @ 2.6 Pile A	20 @ 6.5 Pile A	21 @ 0.9 Pile A
Date Sampled	7-2-91	7-2-91	7-2-91	7-2-91	7-2-91
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	7-5-91
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	7-8-91
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	7-15-91
Dilution Factor					
Sample Matrix	Soil	Soil	Soil	Soil	Soil
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
WTPH-G- Trifluorotoluene	122	160*	160*	240*	386*

Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.

Notes and Discussion:
Surrogate recoveries invalid due to matrix interference.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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

ANALYTICAL NARRATIVE

TPH CHECKLIST
(5030)

Client: Seacor

Lab No.: 18532

Project Name: 000-58-014-01

Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS

Analyzed by: Dean Strom

Lab Number	21	22	23	24	25
Client ID	22 @ 1.0 Pile A	23 @ 2.4 Pile A	24 @ 1.0 Pile A	25 @ 0.8 Pile A	26 @ 1.0 Pile A
Date Sampled	7-2-91	7-2-91	7-2-91	7-2-91	7-2-91
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	7-5-91
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	7-8-91
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	7-15-91
Dilution Factor					
Sample Matrix	Soil	Soil	Soil	Soil	Soil
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
WTPH-G-Trifluorotoluene	69	82	67	81	70
Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.					
Notes and Discussion:					

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS
4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

ANALYTICAL NARRATIVE

TPH CHECKLIST
(5030)

Client: Seacor

Lab No.: 18532

Project Name: 000-58-014-01

Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS

Analyzed by: Dean Strom

Lab Number	26	27	28	29	30
Client ID	27 @ 1.8 Pile A	28 @ 6.8 Pile A	1 @ 2.0 Pile B	2 @ 0.8 Pile B	3 @ 7.0 Pile B
Date Sampled	7-2-91	7-2-91	7-3-91	7-3-91	7-3-91
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	7-5-91
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	7-8-91
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	7-15-91
Dilution Factor					
Sample Matrix	Soil	Soil	Soil	Soil	Soil
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
WTPH-G-Trifluorotoluene	67	71	68	84	78
Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.					
Notes and Discussion:					

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS
4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

ANALYTICAL NARRATIVE

TPH CHECKLIST
(5030)

Client: Seacor

Lab No.: 18532

Project Name: 000-58-014-01

Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS

Analyzed by: Dean Strom

Lab Number	31	32	33	34	35
Client ID	4 @ 3.3 Pile B	5 @ 1.0 Pile B	6 @ 2.6 Pile B	7 @ 3.9 Pile B	8 @ 0.5 Pile B
Date Sampled	7-3-91	7-3-91	7-3-91	7-3-91	7-3-91
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	7-5-91
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	7-8-91
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	7-15-91
Dilution Factor					
Sample Matrix	Soil	Soil	Soil	Soil	Soil
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
WTPH-G- Trifluorotoluene	81	75	106	119	70

Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.

Notes and Discussion:

Sound Analytical Services, Inc.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS
4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

ANALYTICAL NARRATIVE

TPH CHECKLIST
(5030)

Client: Seacor

Lab No.: 18532

Project Name: 000-58-014-01

Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS

Analyzed by: Dean Strom

Lab Number	36	37	38	39	40
Client ID	9 @ 2.3 Pile B	10 @ .05 Pile B	11 @ 2.4 Pile B	12 @ 7.3 Pile B	MW -1
Date Sampled	7-3-91	7-3-91	7-3-91	7-3-91	7-3-91
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	7-5-91
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	7-8-91
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	7-15-91
Dilution Factor					1:1
Sample Matrix	Soil	Soil	Soil	Soil	Water
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
WTPH-G-Trifluorotoluene	85	78	70	98	63

Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.

Notes and Discussion:

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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

ANALYTICAL NARRATIVE

TPH CHECKLIST
(5030)

Client: Seacor

Lab No.: 18532

Project Name: 000-58-014-01

Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS

Analyzed by: Dean Strom

Lab Number	41	42	43	44	
Client ID	MW-2	MW-3	EX-Pond #1	EX-Pond #2	
Date Sampled	7-3-91	7-3-91	7-3-91	7-3-91	
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	
Dilution Factor	1:1	1:1	1:1	1:1	
Sample Matrix	Water	Water	Water	Water	
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
WTPH-G-Trifluorotoluene	62	71	69	65	

Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.

Notes and Discussion:

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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

ANALYTICAL NARRATIVE

BTEX CHECKLIST (5030)

Client: Seacor | Lab No.: 18532

Project Name: 00058-014-01 | Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS | Analyzed by: Dean Strom

Lab Number	1	2	3	4	5
Client ID	1 @ 1.1	2 @ 1.9	3 A 1.8	4 @ 2.3	5 @ 5.2
Date Sampled	7-2-91	7-2-91	7-2-91	7-2-91	7-2-91
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	7-5-91
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	7-8-91
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	7-15-91
Dilution Factor					
Sample Matrix	Soil	Soil	Soil	Soil	Soil
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
Surrogate Recovery METHOD 8020 trifluorotoluene%	90	90	88	89	108
WTPH-G Trifluorotoluene%					

Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.

Notes and Discussion:

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS
4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

ANALYTICAL NARRATIVE

BETX CHECKLIST
(5030)

Client: Seacor

Lab No.: 18532

Project Name: 000-58-014-01

Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS

Analyzed by: Larry Zuraw

Lab Number	6	7	8	9	10
Client ID	6 @ 0.7 Pile A	7@ 5.2 Pile A	8 @ 5.2 Pile A	9 @ 7.4 Pile A	10 @ 1.0 Pile A
Date Sampled	7-2-91	7-2-91	7-2-91	7-2-91	7-2-91
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	7-5-91
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	7-8-91
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	7-15-91
Dilution Factor					
Sample Matrix	Soil	Soil	Soil	Soil	Soil
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
Surrogate Recovery METHOD 8020 Trifluorotoluene	89	83	91	108	102
Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.					
Notes and Discussion:					

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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

ANALYTICAL NARRATIVE

BETX CHECKLIST (5030)

Client: Seacor

Lab No.: 18532

Project Name: 000-58-014-01

Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS

Analyzed by: Larry Zuraw

Lab Number	11	12	13	14	15
Client ID	11 @ 0.3 Pile A	12 @ 0.7 Pile A	13 @ 1.8 Pile A	14 @ 4.1 Pile A	15@ 1.2 Pile A
Date Sampled	7-2-91	7-2-91	7-2-91	7-2-91	7-2-91
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	7-5-91
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	7-8-91
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	7-15-91
Dilution Factor					
Sample Matrix	Soil	Soil	Soil	Soil	Soil
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
Surrogate Recovery METHOD 8020 Trifluorotoluene	90	91	90	90	88

Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.

Notes and Discussion:

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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

ANALYTICAL NARRATIVE

BETX CHECKLIST
(5030)

Client: Seacor

Lab No.: 18532

Project Name: 000-58-014-01

Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS

Analyzed by: Larry Zuraw

Lab Number	21	22	23	24	25
Client ID	22 @ 1.0 Pile A	23 @ 2.4 Pile A	24 @ 1.0 Pile A	25 @ 0.8 Pile A	26 @ 1.0 Pile A
Date Sampled	7-2-91	7-2-91	7-2-91	7-2-91	7-2-91
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	7-5-91
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	7-8-91
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	7-15-91
Dilution Factor					
Sample Matrix	Soil	Soil	Soil	Soil	Soil
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
Surrogate Recovery METHOD 8020 Trifluorotoluene	82	86	93	86	93

Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.

Notes and Discussion:

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS
4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

ANALYTICAL NARRATIVE

BETX CHECKLIST
(5030)

Client: Seacor

Project Name: 000-58-014-01

Delivered by: Joe Palmquist of SAS

Lab No.: 18532

Prepared by: Dawn Werner

Analyzed by: Larry Zuraw

Lab Number	26	27	28	29	30
Client ID	27 @ 1.8 Pile A	28 @ 6.8 Pile A	1 @ 2.0 Pile B	2 @ 0.8 Pile B	3 @ 7.0 Pile B
Date Sampled	7-2-91	7-2-91	7-3-91	7-3-91	7-3-91
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	7-5-91
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	7-8-91
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	7-15-91
Dilution Factor					
Sample Matrix	Soil	Soil	Soil	Soil	Soil
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
Surrogate Recovery METHOD 8020 Trifluorotoluene	93	83	86	101	102

Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.

Notes and Discussion:

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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

ANALYTICAL NARRATIVE

BETX CHECKLIST
(5030)

Client: Seacor

Lab No.: 18532

Project Name: 000-58-014-01

Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS

Analyzed by: Larry Zuraw

Lab Number	31	32	33	34	35
Client ID	4 @ 3.3 Pile B	5 @ 1.0 Pile B	6 @ 2.6 Pile B	7 @ 3.9 Pile B	8 @ 0.5 Pile B
Date Sampled	7-3-91	7-3-91	7-3-91	7-3-91	7-3-91
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	7-5-91
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	7-8-91
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	7-15-91
Dilution Factor					
Sample Matrix	Soil	Soil	Soil	Soil	Soil
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
Surrogate Recovery METHOD 8020 Trifluorotoluene	79	94	69	104	95

Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.

Notes and Discussion:

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS
4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

ANALYTICAL NARRATIVE

BETX CHECKLIST
(5030)

Client: Seacor

Lab No.: 18532

Project Name: 000-58-014-01

Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS

Analyzed by: Larry Zuraw

Lab Number	36	37	38	39	40
Client ID	9 @ 2.3 Pile B	10 @ .05 Pile B	11 @ 2.4 Pile B	12 @ 7.3 Pile B	MW -1
Date Sampled	7-3-91	7-3-91	7-3-91	7-3-91	7-3-91
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	7-5-91
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	7-8-91
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	7-15-91
Dilution Factor					1:1
Sample Matrix	Soil	Soil	Soil	Soil	Water
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
Surrogate Recovery METHOD 8020 Trifluorotoluene	92	90	91	101	83

Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.

Notes and Discussion:

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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

ANALYTICAL NARRATIVE

BETX CHECKLIST
(5030)

Client: Seacor

Lab No.: 18532

Project Name: 000-58-014-01

Prepared by: Dawn Werner

Delivered by: Joe Palmquist of SAS

Analyzed by: Larry Zuraw

Lab Number	41	42	43	44	
Client ID	MW-2	MW-3	EX-Pond #1	EX-Pond #2	
Date Sampled	7-3-91	7-3-91	7-3-91	7-3-91	
Date Received	7-5-91	7-5-91	7-5-91	7-5-91	
Date Extracted	7-8-91	7-8-91	7-8-91	7-8-91	
Date Analyzed	7-15-91	7-15-91	7-15-91	7-15-91	
Dilution Factor	1:1	1:1	1:1	1:1	
Sample Matrix	Water	Water	Water	Water	
Matrix Spike %R					
Matrix Spike Duplicate % RPD					
Surrogate Recovery METHOD 8020 Trifluorotoluene	91	86	92	91	

Condition of samples on receipt: Samples received cold and in good condition. Chain of custody was in order.

Notes and Discussion:

DECEMBER 1991
WATER SAMPLING

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID:	00058-014-01	Sampled:	Dec 17, 1991
11040 Main Street, #240	Matrix Descript:	Water	Received:	Dec 19, 1991
Bellevue, WA 98004	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Dec 20, 1991
Attention: Paul Schmidt	First Sample #:	112-0709	Reported:	Dec 30, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION

Sample Number	Sample Description	Purgeable Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)	Surrogate Recovery %
112-0709	MW-1	790	3.6	2.4	14	11	113
112-0710	MW-2	N.D.	N.D.	N.D.	N.D.	N.D.	94
112-0711	MW-3	18,000	3,300	290	410	260	98
112-0714	Rinse Blank	N.D.	N.D.	N.D.	N.D.	N.D.	77
BLK122091	Method Blank	N.D.	N.D.	N.D.	N.D.	N.D.	93
Detection Limits:		50	0.50	0.50	0.50	0.50	

Purgeable Hydrocarbons are quantitated against a gasoline standard (nC5 - nC14). Surrogate recovery reported is for Bromofluorobenzene.
Analytes reported as N.D. were not present above the stated limit of detection.

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Laboratory Director

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SEACOR	Client Project ID:	00058-014-01		Sampled:	Dec 17, 1991
11040 Main Street, #240	Matrix Descript:	Water		Received:	Dec 19, 1991
Bellevue, WA 98004	Analysis Method:	EPA 3510/8015		Extracted:	Dec 20, 1991
Attention: Paul Schmidt	First Sample #:	112-0709		Analyzed:	Dec 27, 1991
				Reported:	Dec 30, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS

Sample Number	Sample Description	Extractable Hydrocarbons mg/L (ppm)	Surrogate Recovery %
112-0709	MW-1	0.42 D-1	76
112-0710	MW-2	N.D.	82
112-0711	MW-3	7.5 D-1	81
BLK	Method Blank	N.D.	68

Detection Limits:	0.30

Extractable Hydrocarbons are quantitated against a diesel fuel standard (nC11 - nC24). Surrogate recovery reported is for Octacosane.
Analytes reported as N.D. were not present above the stated limit of detection.

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HYDROCARBON ANALYSES FOOTNOTES

Code	Description
PURGEABLE HYDROCARBONS - Gasoline Range Organics	
G 1	The hydrocarbons present in this sample are primarily due to extractable diesel range organics.
G 2	The hydrocarbons present in this sample are a complex mixture of both gasoline range and diesel range organics.
G 3	The total hydrocarbon result in this sample is primarily due to a peak(s) eluting in the purgeable hydrocarbon range. Identification and quantitation by EPA 8010, 8021 or 8240 is recommended.
EXTRACTABLE HYDROCARBONS - Diesel Range Organics	
D 1	The hydrocarbons present in this sample are primarily due to purgeable gasoline range organics.
D 2	The hydrocarbons present in this sample are primarily due to very heavy, non-resolvable oil range organics. Quantitation by EPA 418.1 is recommended.
D 3	The hydrocarbons present in this sample are a complex mixture of purgeable gasoline, extractable diesel and non-resolvable oil range organics.
D 4	The hydrocarbon result shown is an estimated (greater than) value due to high concentration. Reanalysis is being performed to yield a quantitative result.

Oils & Lubricants
[------------------------------]
T.R.P.H. (418.1)

Diesel & Fuel Oils
[--------------------------------------]
Extractables (3550/8015)

Gasoline
[--------------------]
Purgeables (5030/8015)

LOW — LOW TO MEDIUM — MEDIUM — MEDIUM TO HIGH — VERY HIGH

HYDROCARBON BOILING POINT RANGE

CARBON RANGE:
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28

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SEACOR	Client Project ID:	00058-014-01		Sampled:	Dec 17, 1991
11040 Main Street, #240	Sample Descript:	Water, MW-1		Received:	Dec 19, 1991
Bellevue, WA 98004	Analysis Method:	EPA 5030/8010		Analyzed:	Dec 23, 1991
Attention: Paul Schmidt	Lab Number:	112-0709		Reported:	Dec 30, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Bromodichloromethane	1.0	N.D.
Bromoform	1.0	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	5.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	1.0	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	1.0	N.D.
1,2-Dichlorobenzene	2.0	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,1-Dichloroethane	1.0	N.D.
1,2-Dichloroethane	1.0	160
1,1-Dichloroethene	1.0	N.D.
Total 1,2-Dichloroethene	1.0	N.D.
1,2-Dichloropropane	1.0	N.D.
cis-1,3-Dichloropropene	1.0	N.D.
trans-1,3-Dichloropropene	1.0	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	1.0	N.D.
Tetrachloroethene	1.0	N.D.
1,1,1-Trichloroethane	1.0	N.D.
1,1,2-Trichloroethane	1.0	N.D.
Trichloroethene	1.0	N.D.
Trichlorofluoromethane	1.0	N.D.
Vinyl chloride	2.0	N.D.

Surrogate Recovery, %: 80
Analytes reported as N.D. were not present above the stated limit of detection.

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SEACOR	Client Project ID: 00058-014-01	Sampled:	Dec 17, 1991
11040 Main Street, #240	Sample Descript: Water, MW-2	Received:	Dec 19, 1991
Bellevue, WA 98004	Analysis Method: EPA 5030/8010	Analyzed:	Dec 23, 1991
Attention: Paul Schmidt	Lab Number: 112-0710	Reported:	Dec 30, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Bromodichloromethane	1.0	N.D.
Bromoform	1.0	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	5.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	1.0	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	1.0	N.D.
1,2-Dichlorobenzene	2.0	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,1-Dichloroethane	1.0	N.D.
1,2-Dichloroethane	1.0	1.4
1,1-Dichloroethene	1.0	N.D.
Total 1,2-Dichloroethene	1.0	N.D.
1,2-Dichloropropane	1.0	N.D.
cis-1,3-Dichloropropene	1.0	N.D.
trans-1,3-Dichloropropene	1.0	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	1.0	N.D.
Tetrachloroethene	1.0	N.D.
1,1,1-Trichloroethane	1.0	N.D.
1,1,2-Trichloroethane	1.0	N.D.
Trichloroethene	1.0	N.D.
Trichlorofluoromethane	1.0	N.D.
Vinyl chloride	2.0	N.D.

Surrogate Recovery, %: 82
Analytes reported as N.D. were not present above the stated limit of detection.

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SEACOR	Client Project ID: 00058-014-01	Sampled:	Dec 17, 1991
11040 Main Street, #240	Sample Descript: Water, MW-3	Received:	Dec 19, 1991
Bellevue, WA 98004	Analysis Method: EPA 5030/8010	Analyzed:	Dec 23, 1991
Attention: Paul Schmidt	Lab Number: 112-0711	Reported:	Dec 30, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Bromodichloromethane	1.0	N.D.
Bromoform	1.0	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	5.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	1.0	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	1.0	N.D.
1,2-Dichlorobenzene	2.0	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,1-Dichloroethane	1.0	N.D.
1,2-Dichloroethane	1.0	510
1,1-Dichloroethene	1.0	N.D.
Total 1,2-Dichloroethene	1.0	N.D.
1,2-Dichloropropane	1.0	N.D.
cis-1,3-Dichloropropene	1.0	N.D.
trans-1,3-Dichloropropene	1.0	N.D.
Methylene chloride	5.0	26
1,1,2,2-Tetrachloroethane	1.0	N.D.
Tetrachloroethene	1.0	N.D.
1,1,1-Trichloroethane	1.0	N.D.
1,1,2-Trichloroethane	1.0	N.D.
Trichloroethene	1.0	N.D.
Trichlorofluoromethane	1.0	N.D.
Vinyl chloride	2.0	N.D.

Surrogate Recovery, %: 86
Analytes reported as N.D. were not present above the stated limit of detection.

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Please Note:
Methylene Chloride is a suspected laboratory contaminant.

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SEACOR	Client Project ID:	00058-014-01	Sampled:	Dec 17, 1991
11040 Main Street, #240	Sample Descript:	Water, Rinse Blank	Received:	Dec 19, 1991
Bellevue, WA 98004	Analysis Method:	EPA 5030/8010	Analyzed:	Dec 23, 1991
Attention: Paul Schmidt	Lab Number:	112-0714	Reported:	Dec 30, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Bromodichloromethane	1.0	N.D.
Bromoform	1.0	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	5.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	1.0	13
Chloromethane	1.0	N.D.
Dibromochloromethane	1.0	N.D.
1,2-Dichlorobenzene	2.0	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,1-Dichloroethane	1.0	N.D.
1,2-Dichloroethane	1.0	N.D.
1,1-Dichloroethene	1.0	N.D.
Total 1,2-Dichloroethene	1.0	N.D.
1,2-Dichloropropane	1.0	N.D.
cis-1,3-Dichloropropene	1.0	N.D.
trans-1,3-Dichloropropene	1.0	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	1.0	N.D.
Tetrachloroethene	1.0	N.D.
1,1,1-Trichloroethane	1.0	N.D.
1,1,2-Trichloroethane	1.0	N.D.
Trichloroethene	1.0	N.D.
Trichlorofluoromethane	1.0	N.D.
Vinyl chloride	2.0	N.D.

Surrogate Recovery, %: 76
Analytes reported as N.D. were not present above the stated limit of detection.

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SEACOR	Client Project ID: 00058-014-01		
11040 Main Street, #240	Sample Descript: Method Blank		
Bellevue, WA 98004	Analysis Method: EPA 5030/8010	Analyzed:	Dec 23, 1991
Attention: Paul Schmidt	Lab Number: BLK122391	Reported:	Dec 30, 1991

HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Bromodichloromethane	1.0	N.D.
Bromoform	1.0	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	5.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	1.0	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	1.0	N.D.
1,2-Dichlorobenzene	2.0	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,1-Dichloroethane	1.0	N.D.
1,2-Dichloroethane	1.0	N.D.
1,1-Dichloroethene	1.0	N.D.
Total 1,2-Dichloroethene	1.0	N.D.
1,2-Dichloropropane	1.0	N.D.
cis-1,3-Dichloropropene	1.0	N.D.
trans-1,3-Dichloropropene	1.0	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	1.0	N.D.
Tetrachloroethene	1.0	N.D.
1,1,1-Trichloroethane	1.0	N.D.
1,1,2-Trichloroethane	1.0	N.D.
Trichloroethene	1.0	N.D.
Trichlorofluoromethane	1.0	N.D.
Vinyl chloride	2.0	N.D.

Surrogate Recovery, %: 76
Analytes reported as N.D. were not present above the stated limit of detection.

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SEACOR 11040 Main Street, #240 Bellevue, WA 98004 Attention: Paul Schmidt	Client Project ID: 00058-014-01 Method : EPA 5030/8020 Sample Matrix : Water Units : µg/L QC Sample #: 112-0714	Analyst : R. Lister, S. Stowell Analyzed: Dec 20, 1991 Reported: Dec 30, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl benzene	Xylenes
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	5.0	5.0	5.0	15.0
Conc. Matrix Spike:	5.0	5.2	5.2	14.8
Matrix Spike % Recovery:	100	104	104	99
Conc. Matrix Spike Dup.:	5.0	5.0	5.2	14.8
Matrix Spike Duplicate % Recovery:	100	100	104	99
Relative % Difference:	0	3.9	0	0

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% Recovery: $\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$

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SEACOR	Client Project ID: 00058-014-01	Analyst :	D. Harmon
11040 Main Street, #240	Method : EPA 3510 or 3550/8015		
Bellevue, WA 98004	Sample Matrix : Water	Extracted:	Dec 20, 1991
Attention: Paul Schmidt	Units : mg/L	Analyzed:	Dec 27, 1991
	QC Sample #: BLK122091	Reported:	Dec 30, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel Fuel
Sample Conc.:	N.D.
Spike Conc. Added:	1.31
Conc. Matrix Spike:	0.82
Matrix Spike % Recovery:	63
Conc. Matrix Spike Dup.:	0.71
Matrix Spike Duplicate % Recovery:	54
Relative % Difference:	14

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Laboratory Director

% Recovery: $\dfrac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\dfrac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Paul Schmidt

Client Project ID: 00058-014-01
Method : EPA 8010
Sample Matrix : Water
Units : $\mu g/L$
QC Sample #: BLK122391

Analyst : R. Lister

Analyzed: Dec 23, 1991
Reported: Dec 30, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	1,1-DCE	TCE	Chloro-benzene
Sample Conc.:	N.D.	N.D.	N.D.
Spike Conc. Added:	5.0	5.0	5.0
Conc. Matrix Spike:	4.4	5.0	5.2
Matrix Spike % Recovery:	88	100	104
Conc. Matrix Spike Dup.:	4.6	4.8	5.1
Matrix Spike Duplicate % Recovery:	92	96	102
Relative % Difference:	4.4	4.1	1.9

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Laboratory Director

% Recovery: $\dfrac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\dfrac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$

Chain-of-Custody Number: A 2U9

SEACOR Chain-of-Custody Record

Address:
SEACOR
11040 Main St., Ste 240
Bellevue, WA 98004

Project # 00058-014-01 Task # ✓
Project Manager P. Schmidt
Laboratory North Creek Analytical
Turn-around time: 5-Day TAT
Sampler's Name: John Gieber & P. Schmidt
Sampler's Signature: P. Schmidt

Analysis Request

Sample ID	Date	Time	Matrix	TPHg/BTEX 8015 (modified)/8020	TPHd 8015 (modified)	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals	WTPH-HCID			Comments/ Instructions Lab ID	Number of Containers
MW-1	12-17-91	1145	H_2O	✓	✓				✓										5
MW-2	12-17-91	1245	H_2O	✓	✓				✓										5
MW-3	12-17-91	1430	H_2O	✓	✓				✓										5
Rinse Blank	12-17-91		H_2O															Hold	1
Quarry #1	12-18-91	0900	Soil												✓				1
Quarry #2	12-18-91	0900	Soil												✓				1

Special Instructions/Comments:
* 5 DAY TAT - Results due by 12-30-91

Relinquished by:
Sign Paul F. Schmidt
Print Paul Schmidt
Company SEACOR
Time 1225 Date 12-17-91

Received by:
Sign
Print
Company
Time Date

Relinquished by:
Sign
Print
Company
Time Date

Received by:
Sign
Print
Company
Time Date

Sample Receipt

Total no. of containers:
Chain of custody seals:
Rec'd good condition/cold:
Conforms to record:

Client:
Client Contact:
Client Phone Number:

Date 12/19/91 Page 1 of 1

Chain-of-Custody Number: A 209

SEACOR Chain-of-Custody Record

Address:
SEACOR
11040 Main St., Ste 240
Bellevue, WA 98004

Project # 00058-014-01 Task # ✓
Project Manager P. Schmidt
Laboratory North Creek Analytical
Turn-around time: 5-Day TAT

Sampler's Name: John Grieber & P. Schmidt
Sampler's Signature: P. Schmidt

Analysis Request

Sample ID	Date	Time	Matrix	TPHg/BTEX 8015 (modified)/8020	TPHd 8015 (modified)	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals	WTPH-HCID			Comments/Instructions Lab ID	Number of Containers
MW-1	12-17-91	1145	H_2O	✓	✓				✓									1120709	5
MW-2	12-17-91	1245	H_2O	✓	✓				✓									710	5
MW-3	12-17-91	1430	H_2O	✓	✓				✓									711	5
Quarry #1	12-18-91	0900	Soil												✓			712	1
Quarry #2	12-18-91	0900	Soil												✓			713	1
Rinse Blank – Not recorded on Chain TC				✓					✓									714	1

Special Instructions/Comments:
* 5 DAY TAT – Results due by 12-30-91

10-50 2100

Relinquished by:
Sign Paul F. Schmidt
Print PAUL Schmidt
Company SEACOR
Time 1225 Date 12-19-91

Received by:
Sign
Print
Company
Time Date

Relinquished by:
Sign
Print
Company
Time Date

Received by:
Sign T. Collier
Print T. Collier
Company NCA
Time 3:00 Date 12/19/91

Sample Receipt

Total no. of containers 18
Chain of custody seals: ok
Rec'd good condition/cold: ok
Conforms to record: NO

Client:
Client Contact:
Client Phone Number:

Date 12/19/91 Page 1 of 1

NORTH
CREEK
ANALYTICAL

RECEIVED
MAR 20 1992

March 18, 1992

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

Mr. Paul Schmidt
SEACOR
11040 Main Street, #240
Bellevue, WA 98004

Subject: Project #00058.014.01

Dear Mr. Schmidt:

After our recent discussion, I wanted to provide some additional information to help clarify some of the issues concerning the hydrocarbon analyses we performed for this project. While we analyzed several samples by a variety of methods, our discussion revolved around water samples MW 1 and MW 3.

I have reviewed the enclosed chromatograms for both the Volatile and Extractable Hydrocarbons for these two samples. No significant analytical problems were encountered in the analysis and all Quality Control parameters were within established limits. The footnote " D 1" reflected on the Extractable Hydrocarbon report is appropriate, however, the statement "The hydrocarbons present in this sample are primarily due to purgeable gasoline range organics", is probably more correct without the word "primarily". The chromatogram does indicate the presence of gasoline in the diesel range organics analysis, but most of the total hydrocarbons present appears to be due to diesel fuel.

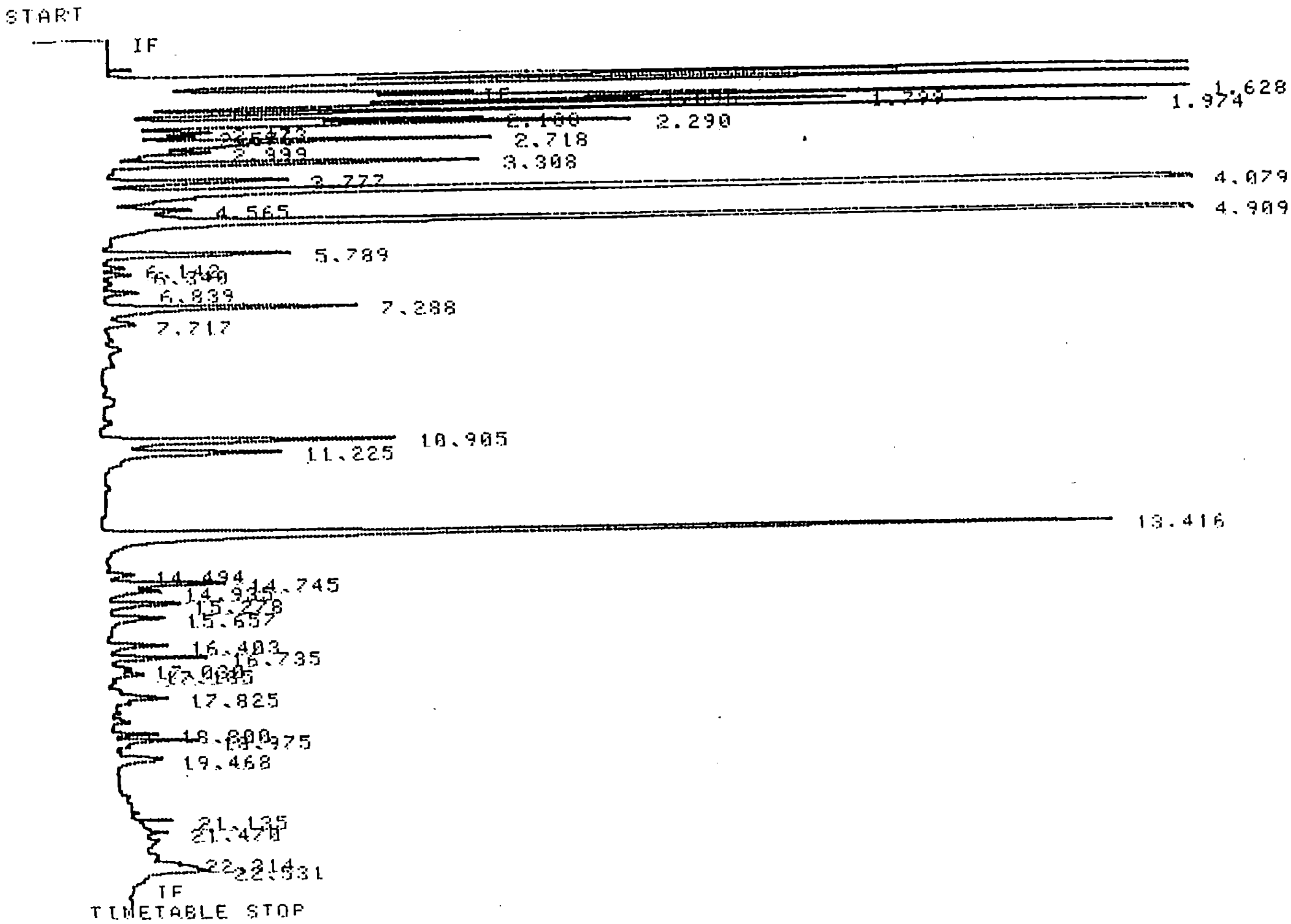
The volatile gasoline range organics analysis appears to have the inverse situation. The majority of the total volatile hydrocarbons is due to gasoline, however, the chromatogram reflects some heavier (> nC 10) alkanes and aromatics not normally found in typical gasoline contaminated soils.

This is one of those situations where the total hydrocarbons should not be evaluated as the sum of the Volatile and Extractable Hydrocarbons (gas + diesel) due to overlap between the two hydrocarbon ranges. I believe it is appropriate to state that the samples analyzed contain petroleum hydrocarbons from both a gasoline and a diesel fuel origin, and this is not a sole source, "either or", situation. I hope this helps to clarify the results we provided. Please call me if I can provide any further assistance.

Very truly yours,

NORTH CREEK ANALYTICAL, Inc.

Scot Cocanour
Laboratory Director



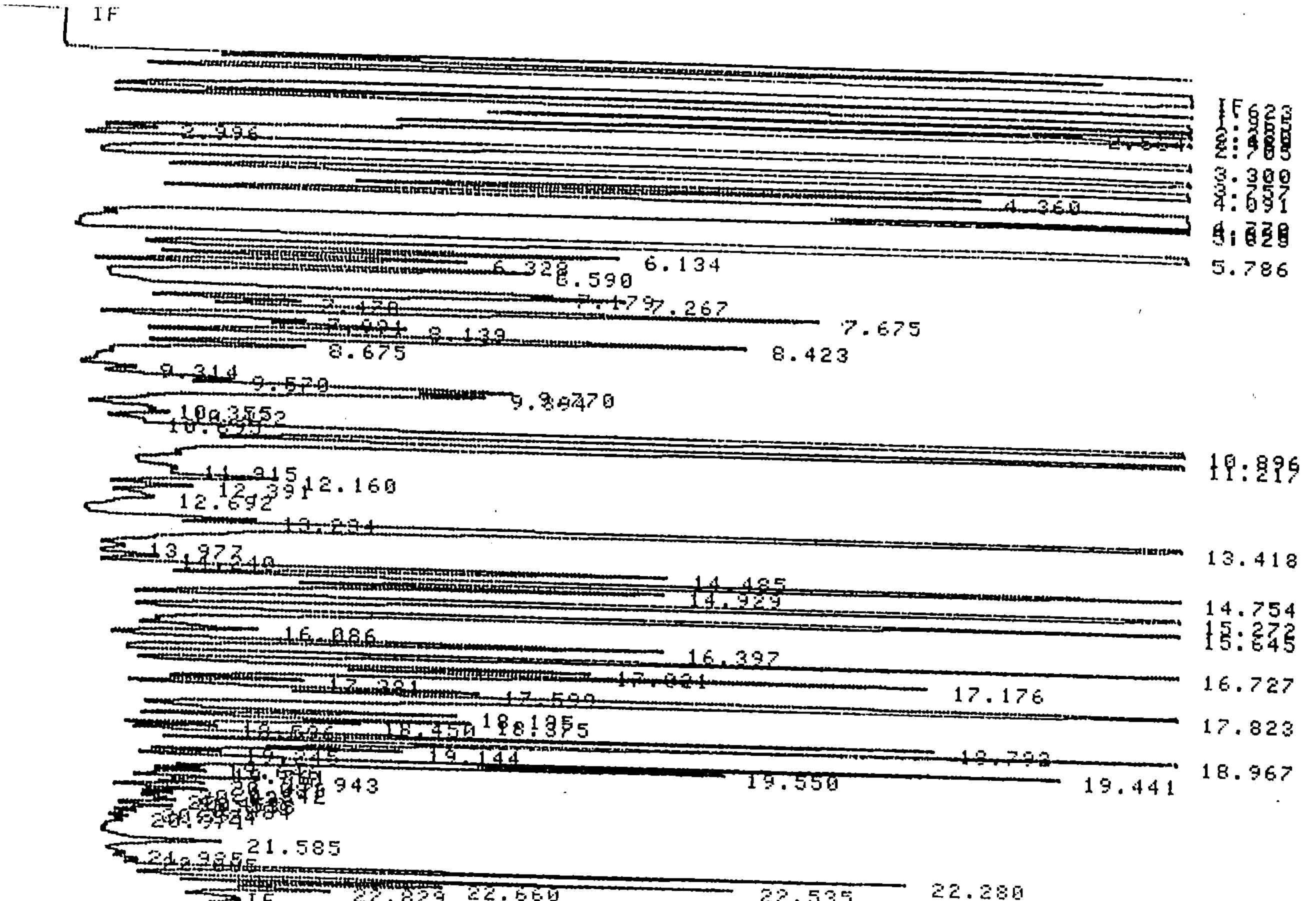
RUN# 5288 DEC 20, 1991 17:53:47 #7 1120711

25µl

GC#2 FID

ISTD-HEIGHT

RT	TYPE	AREA	WIDTH	HEIGHT	CAL#	MASS (ng)	NAME
1.628	BV	26574	.067	6642		35.777	
1.696	VV	7126	.044	2684		14.457	
1.799	VP	19868	.071	4687		25.246	
1.974	PP	24794	.056	7419		39.962	
2.188	PV	9929	.064	2600		14.005	
2.290	VV	18755	.084	3717		20.022	
2.473	VV	3301	.088	624		3.361	
2.576	VV	2262	.071	528		2.844	
2.718	VV	13535	.083	2728		14.694	
2.999	VV	4609	.112	686		3.695	
3.308	VV	15573	.095	2726		14.684	
3.777	PV	8681	.108	1338		7.207	
4.079	VV	145841	.084	28942	1	78.260	BENZENE
4.565	PV	3272	.107	511		2.752	
4.909	VB	82408	.092	14852	28		1,2,3-TFB
5.789	PB	9468	.113	1397		7.525	
6.142	BP	868	.096	151		.813	
6.340	PV	1260	.101	207		1.115	
6.839	PP	1735	.110	263		1.417	
7.288	PV	14337	.126	1894	3	6.295	TOLUENE
7.717	VP	2260	.160	235		1.266	
10.905	PV	16326	.125	2173	4	8.416	ETHYL BENZENE
11.225	VV	11906	.150	1322	5	5.312	M/P XYLENE
13.416	BB	55881	.125	7434	7	84.491	4-BFB



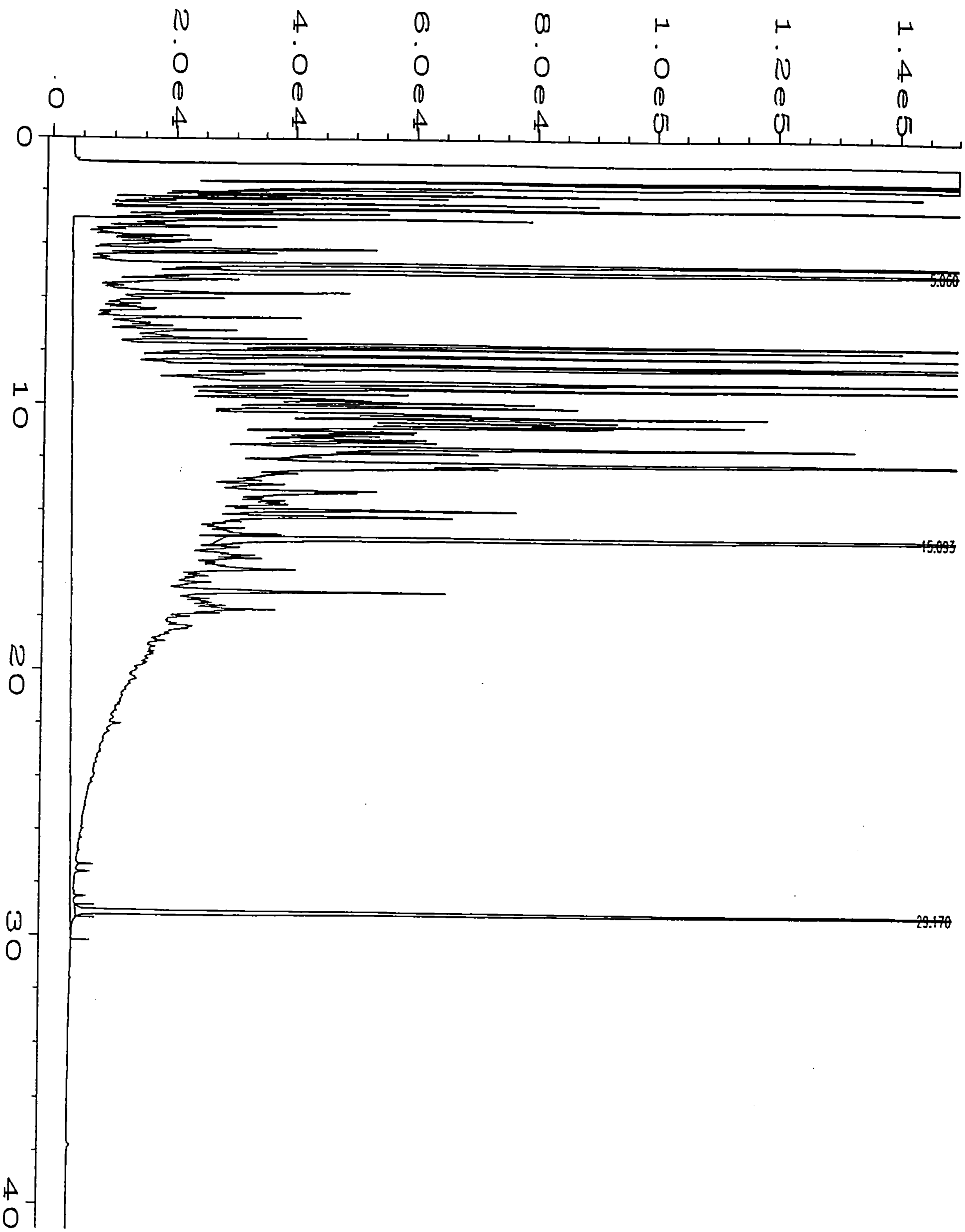
TIMETABLE STOP

RUN# 5286 DEC 20, 1991 16:54:48 #S 1120709

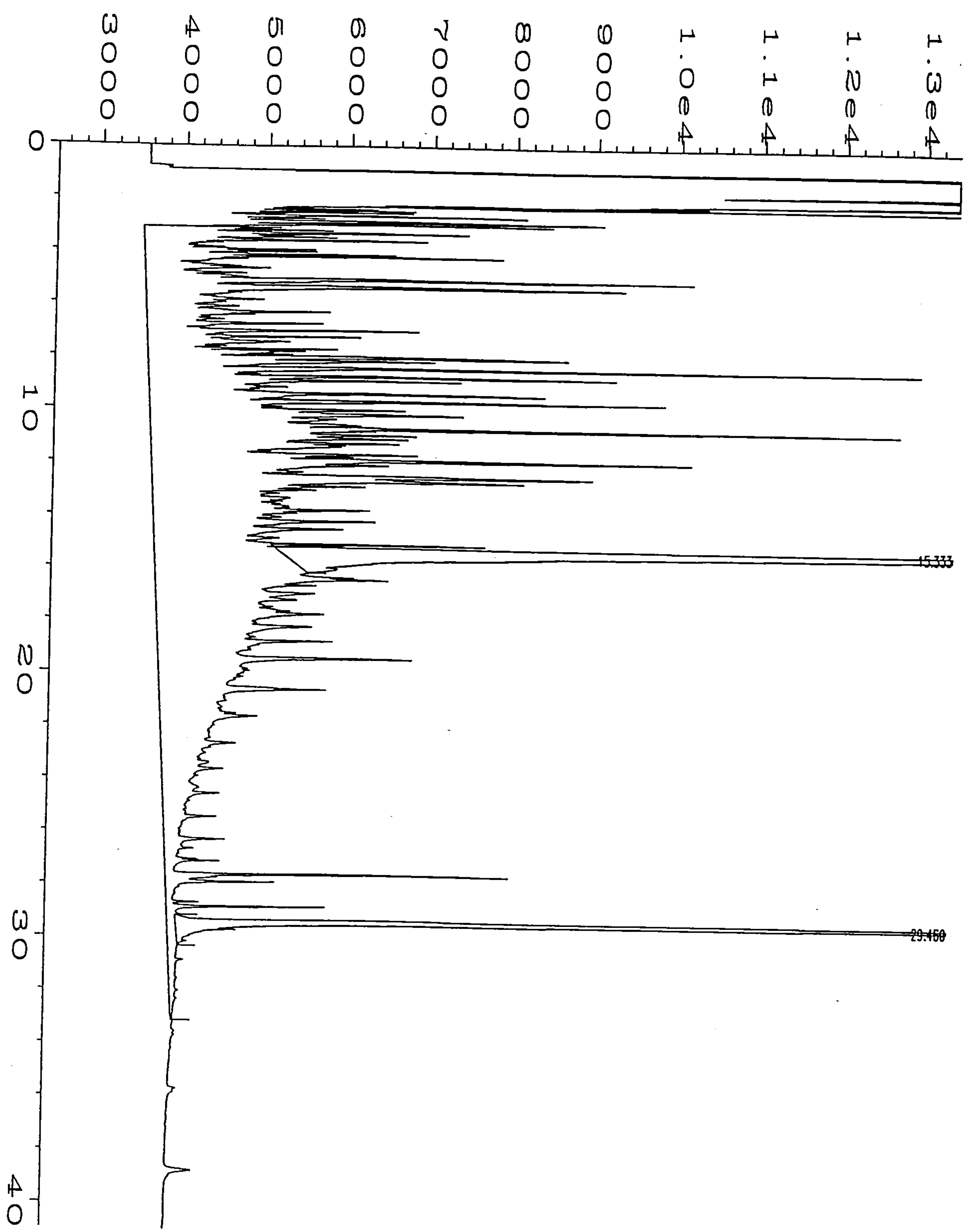
GC#2 FID 666,374 5mL

ISTD-HEIGHT

RT	TYPE	AREA	WIDTH	HEIGHT	CAL#	MASS (ng)	NAME
1.623	BB	373046	.057	108352		559.778	
1.965	BV	28471	.057	8398		43.387	
2.280	VV	310630	.099	52447		270.956	
2.469	VV	96920	.100	16103		83.193	
2.564	VV	25218	.060	6997		36.149	
2.705	VV	154882	.081	31816		164.371	
2.996	VP	2968	.099	501		2.588	
3.300	PB	286388	.097	48958		252.931	
3.757	PB	265515	.072	61205		316.203	
4.091	BV	228060	.122	31156	1	80.802	BENZENE
4.360	VV	38951	.109	5932		30.646	
4.770	VV	154141	.210	12250		63.287	
4.895	VV	85054	.092	15485	2S		1,2,3-TFB
5.025	VV	56251	.094	9949		51.399	
5.786	PV	216163	.114	31563		163.064	
6.134	VV	28328	.122	3869		19.988	
6.328	VV	19096	.114	2780		14.362	
6.590	VV	23838	.123	3233		16.703	
7.179	VV	27009	.133	3384		17.483	
7.267	VV	25242	.108	3907	3	12.454	TOLUENE
7.478	VV	11955	.127	1569		8.106	
7.675	VV	44358	.140	5270		27.226	
7.991	VV	12290	.128	1604		8.287	
8.139	VV	19124	.137	2327		12.022	
8.423	VV	44798	.157	4745		24.514	



Data File Name	: C:\HPCHEM\1\DATA\DEC23\065R0301.D				
Operator	: Dan Harmon		Page Number	:	1
Instrument	: PHILA.		Vial Number	:	65
Sample Name	: 112-0711		Injection Number	:	1
Run Time Bar Code:			Sequence Line	:	3
Acquired on	: 23 Dec 91	06:18 PM	Instrument Method:		TPH1.MTH
Report Created on:	26 Dec 91	08:52 AM	Analysis Method	:	TPH1.MTH



a a File Name : C:\HPCHEM\1\DATA\DEC23\062R0101.D
perator : Dan Harmon
nstrument : PHILA.
a ple Name : 112-0709
u. Time Bar Code:
cq .red on : 23 Dec 91 12:19 PM
e ort Created on: 26 Dec 91 08:43 AM

Page Number : 1
Vial Number : 62
Injection Number : 1
Sequence Line : 1
Instrument Method: TPH1.MTH
Analysis Method : TPH1.MTH

JANUARY 1992
WATER SAMPLING

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID:	CNG Sunnyside, 00058-014-01		
11040 Main Street, #240	Matrix:	Soil		
Bellevue, WA 98004	Analysis for:	Total Solids	Received:	Jan 7, 1992
Attention: Paul Schmidt	First Sample:	201-0120	Reported:	Jan 8, 1992

LABORATORY ANALYSIS FOR: Total Solids

Sample Number	Sample Description	Sample Result %
201-0120	WW-N-7	75
201-0121	NW-E-7	82
201-0122	EW-N-7	81
201-0123	EW-S-7	82

North Creek Analytical routinely provides analytical results for soils, sediments or sludges in a wet weight "as received" basis. To attain dry weight equivalents for regulatory compliance, divide the soil result by the decimal fraction of percent solids.

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID: CNG Sunnyside, 00058-014-01	Sampled:	Jan 6, 1992
11040 Main Street, #240	Matrix Descript: Soil	Received:	Jan 7, 1992
Bellevue, WA 98004	Analysis Method: EPA 5030/8015/8020	Analyzed:	Jan 7, 1992
Attention: Paul Schmidt	First Sample #: 201-0120	Reported:	Jan 7, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (WTPH-G/BTEX)

Sample Number	Sample Description	Purgeable Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)	Surrogate Recovery %
201-0120	WW-N-7	N.D.	N.D.	N.D.	N.D.	N.D.	97
201-0121	NW-E-7	N.D.	N.D.	N.D.	N.D.	N.D.	98
201-0122	EW-N-7	6,700	N.D.	12	23	240	118
201-0123	EW-S-7	N.D.	N.D.	N.D.	N.D.	N.D.	98
BLK010792	Method Blank	N.D.	N.D.	N.D.	N.D.	N.D.	99
Detection Limits:		1.0	0.050	0.10	0.10	0.10	

Purgeable Hydrocarbons are quantitated against a gasoline standard (nC5 - nC14). Surrogate recovery reported is for Bromofluorobenzene. Analytes reported as N.D. were not present above the stated limit of detection.

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Scot Cocanour
Laboratory Director

Please Note:
The detection limit for Benzene in #201-0122 = 4.0 mg/kg.
The detection limit for Purgeable Hydrocarbons in #201-0123 = 2.0 mg/kg.

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID:	CNG Sunnyside, 00058-014-01	Sampled:	Jan 6, 1992
11040 Main Street, #240	Matrix Descript:	Soil	Received:	Jan 7, 1992
Bellevue, WA 98004	Analysis Method:	EPA 3550/8015	Extracted:	Jan 7, 1992
Attention: Paul Schmidt	First Sample #:	201-0120	Analyzed:	Jan 7, 1992
			Reported:	Jan 7-8, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS (WTPH-D)

Sample Number	Sample Description	Extractable Hydrocarbons mg/kg (ppm)	Surrogate Recovery %
201-0120	WW-N-7	N.D.	109
201-0121	NW-E-7	N.D.	125
201-0122	EW-N-7	11,000	Not Available
201-0123	EW-S-7	130	68
BLK010792	Method Blank	N.D.	99

Detection Limits:	10

Extractable Hydrocarbons are quantitated against a diesel fuel standard (nC11 - nC24). Surrogate recovery reported is for Octacosane.
Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID:	CNG Sunnyside, 00058-014-01	Sampled:	Jan 6, 1992
11040 Main Street, #240	Sample Descript:	Soil, EW-N-7	Received:	Jan 7, 1992
Bellevue, WA 98004	Analysis Method:	EPA 8270	Extracted:	Jan 7, 1992
Attention: Paul Schmidt	Lab Number:	201-0122	Analyzed:	Jan 7, 1992
			Reported:	Jan 8, 1992

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acenaphthene	2.0	N.D.
Acenaphthylene	2.0	N.D.
Aniline	2.0	N.D.
Anthracene	2.0	N.D.
Benzidine	5.0	N.D.
Benzoic Acid	10	N.D.
Benzo(a)anthracene	2.0	N.D.
Benzo(b)fluoranthene	2.0	N.D.
Benzo(k)fluoranthene	2.0	N.D.
Benzo(g,h,i)perylene	2.0	N.D.
Benzo(a)pyrene	2.0	N.D.
Benzyl alcohol	2.0	N.D.
Bis(2-chloroethoxy)methane	2.0	N.D.
Bis(2-chloroethyl)ether	2.0	N.D.
Bis(2-chloroisopropyl)ether	2.0	N.D.
Bis(2-ethylhexyl)phthalate	10	N.D.
4-Bromophenyl phenyl ether	2.0	N.D.
Butyl benzyl phthalate	2.0	N.D.
4-Chloroaniline	2.0	N.D.
2-Chloronaphthalene	2.0	N.D.
4-Chloro-3-methylphenol	2.0	N.D.
2-Chlorophenol	2.0	N.D.
4-Chlorophenyl phenyl ether	2.0	N.D.
Chrysene	2.0	N.D.
Dibenz(a,h)anthracene	2.0	N.D.
Dibenzofuran	2.0	N.D.
Di-N-butyl phthalate	10	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
1,2-Dichlorobenzene	2.0	N.D.
3,3-Dichlorobenzidine	10	N.D.
2,4-Dichlorophenol	2.0	N.D.
Diethyl phthalate	2.0	N.D.
2,4-Dimethylphenol	2.0	N.D.
Dimethyl phthalate	2.0	N.D.
4,6-Dinitro-2-methylphenol	10	N.D.
2,4-Dinitrophenol	10	N.D.

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID:	CNG Sunnyside, 00058-014-01		Sampled:	Jan 6, 1992
11040 Main Street, #240	Sample Descript:	Soil, EW-N-7		Received:	Jan 7, 1992
Bellevue, WA 98004	Analysis Method:	EPA 8270		Extracted:	Jan 7, 1992
Attention: Paul Schmidt	Lab Number:	201-0122		Analyzed:	Jan 7, 1992

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
2,4-Dinitrotoluene	2.0	N.D.
2,6-Dinitrotoluene	2.0	N.D.
Di-N-octyl phthalate	2.0	N.D.
Fluoranthene	2.0	N.D.
Fluorene	2.0	N.D.
Hexachlorobenzene	2.0	N.D.
Hexachlorobutadiene	2.0	N.D.
Hexachlorocyclopentadiene	2.0	N.D.
Hexachloroethane	2.0	N.D.
Indeno(1,2,3-cd)pyrene	2.0	N.D.
Isophorone	2.0	4.9
2-Methylnaphthalene	2.0	26
2-Methylphenol	2.0	N.D.
4-Methylphenol	2.0	N.D.
Naphthalene	2.0	36
2-Nitroaniline	10	N.D.
3-Nitroaniline	10	N.D.
4-Nitroaniline	10	N.D.
Nitrobenzene	2.0	N.D.
2-Nitrophenol	2.0	N.D.
4-Nitrophenol	10	N.D.
N-Nitrosodiphenylamine	2.0	N.D.
N-Nitroso-di-N-propylamine	2.0	N.D.
Pentachlorophenol	10	N.D.
Phenanthrene	2.0	2.6
Phenol	2.0	N.D.
Pyrene	2.0	N.D.
1,2,4-Trichlorobenzene	2.0	N.D.
2,4,5-Trichlorophenol	10	N.D.
2,4,6-Trichlorophenol	2.0	N.D.

Surrogate Standards Percent Recovery:

2-Fluorophenol	96	Nitrobenzene-d5	105
Phenol-d6	136	2-Fluorobiphenyl	101
2,4,6-Tribromophenol	106	Terphenyl-d14	119

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID:	CNG Sunnyside, 00058-014-01		
11040 Main Street, #240	Sample Descript:	Method Blank		
Bellevue, WA 98004	Analysis Method:	EPA 8270	Extracted:	Jan 7, 1992
Attention: Paul Schmidt	Lab Number:	BLK010792	Analyzed:	Jan 7, 1992
			Reported:	Jan 8, 1992

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acenaphthene	0.10	N.D.
Acenaphthylene	0.10	N.D.
Aniline	0.10	N.D.
Anthracene	0.10	N.D.
Benzidine	0.25	N.D.
Benzoic Acid	0.50	N.D.
Benzo(a)anthracene	0.10	N.D.
Benzo(b)fluoranthene	0.10	N.D.
Benzo(k)fluoranthene	0.10	N.D.
Benzo(g,h,i)perylene	0.10	N.D.
Benzo(a)pyrene	0.10	N.D.
Benzyl alcohol	0.10	N.D.
Bis(2-chloroethoxy)methane	0.10	N.D.
Bis(2-chloroethyl)ether	0.10	N.D.
Bis(2-chloroisopropyl)ether	0.10	N.D.
Bis(2-ethylhexyl)phthalate	0.50	N.D.
4-Bromophenyl phenyl ether	0.10	N.D.
Butyl benzyl phthalate	0.10	N.D.
4-Chloroaniline	0.10	N.D.
2-Chloronaphthalene	0.10	N.D.
4-Chloro-3-methylphenol	0.10	N.D.
2-Chlorophenol	0.10	N.D.
4-Chlorophenyl phenyl ether	0.10	N.D.
Chrysene	0.10	N.D.
Dibenz(a,h)anthracene	0.10	N.D.
Dibenzofuran	0.10	N.D.
Di-N-butyl phthalate	0.50	N.D.
1,3-Dichlorobenzene	0.10	N.D.
1,4-Dichlorobenzene	0.10	N.D.
1,2-Dichlorobenzene	0.10	N.D.
3,3-Dichlorobenzidine	0.50	N.D.
2,4-Dichlorophenol	0.10	N.D.
Diethyl phthalate	0.10	N.D.
2,4-Dimethylphenol	0.10	N.D.
Dimethyl phthalate	0.10	N.D.
4,6-Dinitro-2-methylphenol	0.50	N.D.
2,4-Dinitrophenol	0.50	N.D.

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID: CNG Sunnyside, 00058-014-01		
11040 Main Street, #240	Sample Descript: Method Blank		
Bellevue, WA 98004	Analysis Method: EPA 8270	Extracted:	Jan 7, 1992
Attention: Paul Schmidt	Lab Number: BLK010792	Analyzed:	Jan 7, 1992
		Reported:	Jan 8, 1992

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
2,4-Dinitrotoluene	0.10	N.D.
2,6-Dinitrotoluene	0.10	N.D.
Di-N-octyl phthalate	0.10	N.D.
Fluoranthene	0.10	N.D.
Fluorene	0.10	N.D.
Hexachlorobenzene	0.10	N.D.
Hexachlorobutadiene.	0.10	N.D.
Hexachlorocyclopentadiene	0.10	N.D.
Hexachloroethane	0.10	N.D.
Indeno(1,2,3-cd)pyrene	0.10	N.D.
Isophorone	0.10	N.D.
2-Methylnaphthalene	0.10	N.D.
2-Methylphenol	0.10	N.D.
4-Methylphenol	0.10	N.D.
Naphthalene	0.10	N.D.
2-Nitroaniline	0.50	N.D.
3-Nitroaniline	0.50	N.D.
4-Nitroaniline	0.50	N.D.
Nitrobenzene	0.10	N.D.
2-Nitrophenol	0.10	N.D.
4-Nitrophenol	0.50	N.D.
N-Nitrosodiphenylamine	0.10	N.D.
N-Nitroso-di-N-propylamine	0.10	N.D.
Pentachlorophenol	0.50	N.D.
Phenanthrene	0.10	N.D.
Phenol	0.10	N.D.
Pyrene	0.10	N.D.
1,2,4-Trichlorobenzene	0.10	N.D.
2,4,5-Trichlorophenol	0.50	N.D.
2,4,6-Trichlorophenol	0.10	N.D.

Surrogate Standards Percent Recovery:

2-Fluorophenol	91	Nitrobenzene-d5	85
Phenol-d6	85	2-Fluorobiphenyl	93
2,4,6-Tribromophenol	82	Terphenyl-d14	116

Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Paul Schmidt

Client Project ID: CNG Sunnyside, 00058-014-01
Method : EPA 5030/8020
Sample Matrix : Soil
Units : mg/kg
QC Sample #: 201-0120

Analyst : R. Lister
S. Stowell

Analyzed: Jan 7, 1992
Reported: Jan 7, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl benzene	Xylenes
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.50	0.50	0.50	1.50
Conc. Matrix Spike:	0.34	0.39	0.45	1.27
Matrix Spike % Recovery:	68	78	90	85
Conc. Matrix Spike Dup.:	0.34	0.38	0.44	1.24
Matrix Spike Duplicate % Recovery:	68	76	88	83
Relative % Difference:	0	2.6	2.2	2.4

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

% Recovery: $\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$

NORTH
CREEK
ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Paul Schmidt

Client Project ID: CNG Sunnyside, 00058-014-01
Method : EPA 8270
Sample Matrix : Soil
Units : mg/kg
QC Sample #: BLK010792

Analyst : G. Emory
Extracted: Jan 7, 1992
Analyzed: Jan 7, 1992
Reported: Jan 8, 1992

QUALITY CONTROL DATA REPORT

Analyte	Sample Conc.	Spike Conc. Added	Conc. Matrix Spike	Matrix Spike % Recovery	Conc. Matrix Spike Duplicate	Matrix Spike Duplicate % Recovery	Relative % Difference
Phenol	N.D.	6.7	4.8	72%	5.2	78%	8.0%
2-Chlorophenol	N.D.	6.7	5.3	79%	5.8	87%	9.0%
1,4-Dichloro-benzene	N.D.	3.3	2.4	73%	2.5	76%	4.1%
N-Nitroso-Di-N-propylamine	N.D.	3.3	2.5	76%	2.7	82%	7.7%
1,2,4-Trichloro-benzene	N.D.	3.3	2.4	73%	2.6	79%	8.0%
4-Chloro-3-Methylphenol	N.D.	6.7	5.5	82%	5.7	85%	3.6%
Acenaphthene	N.D.	3.3	2.7	82%	2.9	88%	7.1%
4-Nitrophenol	N.D.	6.7	6.3	94%	6.6	99%	4.7%
2,4-Dinitro-toluene	N.D.	3.3	2.4	73%	2.4	73%	0.0%
Pentachloro-phenol	N.D.	6.7	6.1	91%	6.7	100%	9.4%
Pyrene	N.D.	3.3	3.0	91%	3.2	97%	6.5%

NORTH CREEK ANALYTICAL

Scot Cocanour
Scot Cocanour
Laboratory Director

% Recovery: $\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR 11040 Main Street, #240 Bellevue, WA 98004 Attention: Paul Schmidt	Client Project ID: CNG Sunnyside, 00058-014-01 Method : EPA 3510 or 3550/8015 Sample Matrix : Soil Units : mg/kg QC Sample #: BLK010792	Analyst : D. Harmon Extracted: Jan 7, 1992 Analyzed: Jan 7, 1992 Reported: Jan 7, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel Fuel
Sample Conc.:	N.D.
Spike Conc. Added:	44
Conc. Matrix Spike:	44
Matrix Spike % Recovery:	100
Conc. Matrix Spike Dup.:	48
Matrix Spike Duplicate % Recovery:	110
Relative % Difference:	8.7

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

% Recovery: $\dfrac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\dfrac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$

Chain-of-Custody Number: A 20E

SEACOR Chain-of-Custody Record

Address: SEACOR
4040 Main St Ste 240
Bellevue WA 98004

Project # 00058-014-01 Task #
Project Manager Paul Schmidt
Laboratory North Creek Analytical
Turn-around time: 2-8 hr

Sampler's Name: John M. Graber
Sampler's Signature: John M. Graber

Analysis Request

Sample ID	Date	Time	Matrix	TPHg/BTEX 8015 (modified)/8020	TPHd 8015 (modified)	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals				Comments/ Instructions	Number of Containers
NW-M-7	1/6/92	1348	soil	X	X			X		X							HOLD	8240, 8270, TAT to be determined	1
NW-W-7		1400		X	X													HOLD KS	1
WW-N-7 2010120		1420		X	X														1
WW-M-7		1437		X	X													HOLD KS	1
WW-S-7		1450		X	X			X		X							HOLD	8240, 8270, ~~to be~~ TAT to be Determined	1
NW-E-7 121		1507		X	X														1
EW-N-7 122		1520		X	X			X		X	8270			2010122				8240, 8270 TAT to be determined	1
EW-M-4		1525		X	X													HOLD KS	1
EW-M-7		1530		X	X													HOLD KS	1
EW-S-7 123	↓	1540	↓	X	X														1

Special Instructions/Comments:
Project Name:
CNG-Sunneyside

Relinquished by:
Sign John M. Graber
Print John M. Graber
Company SEACOR
Time 1620 Date 1/6/92

Received by:
Sign M. [illegible]
Print
Company
Time Date

Relinquished by:
Sign
Print
Company
Time Date

Received by:
Sign [illegible] Collier
Print T. Collier
Company NCA
Time 10:25 Date 1/7/91

Sample Receipt

Total no. of containers	10
Chain of custody seals:	None
Rec'd good condition/cold:	ok
Conforms to record:	ok

Cascade Natural Gas
Client:
Paul Schmidt
Client Contact:
(206) 646-0280
Client Phone Number:

Date 01/06/92 Page 1 of 1

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01			
11040 Main Street, #240	Matrix:	Soil			
Bellevue, WA 98004	Analysis for:	Total Solids		Received:	Jan 8, 1992
Attention: Paul Schmidt	First Sample #:	201-0153		Reported:	Jan 8, 1992

LABORATORY ANALYSIS FOR: Total Solids

Sample Number	Sample Description	Sample Result %
201-0153	EW2-N-7	87
201-0155	EW2-M-7	87
201-0158	NW3-M-7	91
201-0159	NW2-MW-7	86
201-0160	NW2-ME-7	92
201-0162	WW2-MS-5.5	90
201-0163	WW2-S-7	91
201-0169	EB-S-8	87
201-0170	EB-N-8	78
201-0173	WB-N-8	79
201-0174	WB-S-8	73

North Creek Analytical routinely provides analytical results for soils, sediments or sludges in a wet weight "as received" basis.
To attain dry weight equivalents for regulatory compliance, divide the soil result by the decimal fraction of percent solids.

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01		Sampled:	Jan 7, 1992
11040 Main Street, #240	Matrix Descript:	Soil		Received:	Jan 8, 1992
Bellevue, WA 98004	Analysis Method:	EPA 5030/8015/8020		Analyzed:	Jan 8, 1992
Attention: Paul Schmidt	First Sample #:	201-0153		Reported:	Jan 8, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (WTPH-G/BTEX)

Sample Number	Sample Description	Purgeable Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)	Surrogate Recovery %
201-0153	EW2-N-7	N.D.	N.D.	N.D.	N.D.	N.D.	98
201-0155	EW2-M-7	N.D.	N.D.	N.D.	N.D.	N.D.	98
201-0158	NW3-M-7	N.D.	N.D.	N.D.	N.D.	N.D.	73
201-0159	NW2-MW-7	N.D.	N.D.	N.D.	N.D.	N.D.	98
201-0160	NW2-ME-7	N.D.	N.D.	N.D.	N.D.	N.D.	99
201-0162	WW2-MS-5.5	N.D.	N.D.	N.D.	N.D.	N.D.	99
201-0163	WW2-S-7	N.D.	N.D.	N.D.	N.D.	N.D.	100
201-0169	EB-S-8	4,000 G2	3.3	N.D.	23	64	125
201-0170	EB-N-8	1,400 G2	N.D.	N.D.	3.4	13	116
201-0173	WB-N-8	130 G2	N.D.	N.D.	N.D.	0.12	105
Detection Limits:		**1.0**	**0.050**	**0.10**	**0.10**	**0.10**	

Purgeable Hydrocarbons are quantitated against a gasoline standard (nC5 - nC14). Surrogate recovery reported is for Bromofluorobenzene.
Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

Please Note:
The detection limit for Toluene in # 201-0169 = 1.0 mg/kg.
The detection limit for Benzene and Toluene in # 201-0170 = 1.0 mg/kg.

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01	Sampled:	Jan 7, 1992
11040 Main Street, #240	Matrix Descript:	Soil	Received:	Jan 8, 1992
Bellevue, WA 98004	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jan 8, 1992
Attention: Paul Schmidt	First Sample #:	201-0174	Reported:	Jan 8, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (WTPH-G/BTEX)

Sample Number	Sample Description	Purgeable Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)	Surrogate Recovery %
201-0174	WB-S-8	420 G2	0.97	N.D.	2.1	2.4	123
BLK010892	Method Blank	N.D.	N.D.	N.D.	N.D.	N.D.	97
Detection Limits:		**1.0**	**0.050**	**0.10**	**0.10**	**0.10**	

Purgeable Hydrocarbons are quantitated against a gasoline standard (nC5 - nC14). Surrogate recovery reported is for Bromofluorobenzene. Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

Please Note:
The detection limit for Toluene in # 201-0174 = 0.20 mg/kg.

NORTH
CREEK
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Phone (206) 481-9200 • FAX (206) 485-2992

HYDROCARBON ANALYSES FOOTNOTES

Code	Description
PURGEABLE HYDROCARBONS - Gasoline Range Organics	
G 1	The hydrocarbons present in this sample are primarily due to extractable diesel range organics.
G 2	The hydrocarbons present in this sample are a complex mixture of both gasoline range and diesel range organics.
G 3	The total hydrocarbon result in this sample is primarily due to a peak(s) eluting in the purgeable hydrocarbon range. Identification and quantitation by EPA 8010, 8021 or 8240 is recommended.
EXTRACTABLE HYDROCARBONS - Diesel Range Organics	
D 1	The hydrocarbons present in this sample are primarily due to purgeable gasoline range organics.
D 2	The hydrocarbons present in this sample are primarily due to very heavy, non-resolvable oil range organics. Quantitation by EPA 418.1 is recommended.
D 3	The hydrocarbons present in this sample are a complex mixture of purgeable gasoline, extractable diesel and non-resolvable oil range organics.
D 4	The hydrocarbon result shown is an estimated (greater than) value due to high concentration. Reanalysis is being performed to yield a quantitative result.

Oils & Lubricants
[------------------------------]
T.R.P.H. (418.1)

Diesel & Fuel Oils
[-------------------------------------]
Extractables (3550/8015)

Gasoline
[--------------------]
Purgeables (5030/8015)

LOW **LOW TO MEDIUM** **MEDIUM** **MEDIUM TO HIGH** **VERY HIGH**
HYDROCARBON BOILING POINT RANGE

CARBON RANGE:
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01		Sampled:	Jan 7, 1992
11040 Main Street, #240	Matrix Descript:	Soil		Received:	Jan 8, 1992
Bellevue, WA 98004	Analysis Method:	EPA 3550/8015		Extracted:	Jan 8, 1992
Attention: Paul Schmidt	First Sample #:	201-0153		Analyzed:	Jan 8, 1992
				Reported:	Jan 9, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS (WTPH-D)

Sample Number	Sample Description	Extractable Hydrocarbons mg/kg (ppm)	Surrogate Recovery %
201-0153	EW2-N-7	N.D.	80
201-0155	EW2-M-7	N.D.	58
201-0158	NW3-M-7	17	81
201-0159	NW2-MW-7	N.D.	67
201-0160	NW2-ME-7	N.D.	75
201-0162	WW2-M-7	N.D.	87
201-0163	WW2-S-7	N.D.	82
201-0169	EB-S-8	2,900	Not Available
201-0170	EB-N-8	370	Not Available
201-0173	WB-N-8	80	64
Detection Limits:		10	

Extractable Hydrocarbons are quantitated against a diesel fuel standard (nC11 - nC24). Surrogate recovery reported is for Octacosane.
Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID: CNG Sunnyside 00058-014-01	Sampled:	Jan 7, 1992
11040 Main Street, #240	Matrix Descript: Soil	Received:	Jan 8, 1992
Bellevue, WA 98004	Analysis Method: EPA 3550/8015	Extracted:	Jan 8, 1992
Attention: Paul Schmidt	First Sample #: 201-0174	Analyzed:	Jan 8, 1992
		Reported:	Jan 9, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS (WTPH-D)

Sample Number	Sample Description	Extractable Hydrocarbons mg/kg (ppm)	Surrogate Recovery %
201-0174	WB-S-8	340	136
BLK010892	Method Blank	N.D.	99

Detection Limits:	10

Extractable Hydrocarbons are quantitated against a diesel fuel standard (nC11 - nC24). Surrogate recovery reported is for Octacosane.
Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL

Scot Cocanour
Scot Cocanour
Laboratory Director

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Paul Schmidt

Client Project ID: CNG Sunnyside 00058-014-01
Method : EPA 5030/8020
Sample Matrix : Soil
Units : mg/kg
QC Sample #: 201-0159

Analyst : R. Lister
S. Stowell

Analyzed: Jan 8, 1992
Reported: Jan 9, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl benzene	Xylenes
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.50	0.50	0.50	1.50
Conc. Matrix Spike:	0.32	0.33	0.40	1.16
Matrix Spike % Recovery:	64	66	80	77
Conc. Matrix Spike Dup.:	0.34	0.35	0.42	1.22
Matrix Spike Duplicate % Recovery:	68	70	84	81
Relative % Difference:	6.1	5.9	4.9	5.1

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

% Recovery: $\dfrac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\dfrac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Paul Schmidt

Client Project ID: CNG Sunnyside 00058-014-01
Method : EPA 3510 or 3550/8015
Sample Matrix : Soil
Units : mg/kg
QC Sample #: BLK010892

Analyst : D. Harmon
Extracted: Jan 8, 1992
Analyzed: Jan 8, 1992
Reported: Jan 9, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel Fuel
Sample Conc.:	N.D.
Spike Conc. Added:	44
Conc. Matrix Spike:	44
Matrix Spike % Recovery:	100
Conc. Matrix Spike Dup.:	48
Matrix Spike Duplicate % Recovery:	110
Relative % Difference:	8.7

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

% Recovery: $\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{(\text{Conc. of M.S. + Conc. of M.S.D.}) / 2} \times 100$

Chain-of-Custody Number: A 209

SEACOR Chain-of-Custody Record

Address: SEACOR
11040 Main St Ste 240
Bellevue WA 98004

Project # 00055-014-01 Task # ______
Project Manager Paul Schmidt
Laboratory NCA
Turn-around time: 2-8

Sampler's Name: John M Greber
Sampler's Signature: John M. Greber

Analysis Request

Sample ID	Date	Time	Matrix	TPHg/BTEX 8015 (modified)/8020	TPHd 8015 (modified)	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals		Comments/ Instructions	Number of Containers
EW•2-MS-6	1/7/92	0940	Soil	X	X										2010152	FAX Copy to	1
* EW2-N-7		1020		X	X										2010153	P.M. before Starting	1
EW2-MN-6.5		1030		X	X										2010154	Analysis	1
* EW2-M-7		1035		X	X											2010155	1
NW2-W-7		1237		X	X											2010156	1
NW2-M-6.5		1410		X	X											2010157	1
* NW3-M-7		1500		X	X											2010158	1
* NW2-MW-7		1505		X	X											2010159	1
* NW2-ME-7	↓	1510	↓	X	X											2010160	1

Special Instructions/Comments:
Job name: CNG-Sunnyside

Relinquished by:	Received by:
Sign John M. Greber	Sign Dana Heinz
Print John M. Greber	Print DANA HEINZ
Company SEACOR	Company NCA
Time 1620 Date 1/7/92	Time 10:30 Date 1-8-92

Relinquished by:	Received by:
Sign ______	Sign ______
Print ______	Print ______
Company ______	Company ______
Time ______ Date ______	Time ______ Date ______

Sample Receipt

Total no. of containers	23
Chain of custody seals:	N/A
Rec'd good condition/cold:	OK
Conforms to record:	

Client: Cascade Nat. Gas
Client Contact: Paul S.
Client Phone Number: (206) 646 0280

Date 1/7/92 Page 1 of 3

Chain-of-Custody Number: A 209

SEACOR Chain-of-Custody Record

Address:
SEACOR
11040 Main St Ste 240
Bellevue WA 98004

Project # C0058-014-01 Task # ____
Project Manager Paul Schmidt
Laboratory NCA
Turn-around time: 2-8
Sampler's Name: John M Gerber
Sampler's Signature: John M. Gulm

Sample ID	Date	Time	Matrix	TPHg/BTEX 8015 (modified)/8020	TPHd 8015 (modified)	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals				Comments/ Instructions	Number of Containers
WW2-M-7	1/7/92	1300	Soil	X	X										2010161			Fax copy to P.M	1
* WW2-MS-5.5		1325		X	X										2010162			before starting	1
* WW2-S-7		1340		X	X										2010163			Analysis	1
SW Corner-7		1357		X	X													2010164	1
SP-1		1130		X	X													2010165	1
SP-2		1147		X	X													2010166	1
SP-3		1350		X	X													2010167	1
SP-4		1430		X	X													2010168	1

Special Instructions/Comments:
Job Name:
CNG - Sunnyside

Relinquished by:
Sign John M. Gulm
Print John M. Gerber
Company SEACOR
Time 1620 Date 1/7/92

Received by:
Sign Dana Heinz
Print DANA HEINZ
Company NCA
Time 10:30 Date 1/8/92

Relinquished by:
Sign ____
Print ____
Company ____
Time ____ Date ____

Received by:
Sign ____
Print ____
Company ____
Time ____ Date ____

Sample Receipt

Total no. of containers: 23
Chain of custody seals: N/A
Rec'd good condition/cold: OK
Conforms to record:

Client: Cascade Nat. Gas
Client Contact: Paul S.
Client Phone Number: (206) 646-0280

Date 1/7/92 Page 2 of 3

Chain-of-Custody Number: A 209

SEACOR Chain-of-Custody Record

Address: SEACOR
11040 Main St Ste 240
Bellevue WA 98006

Project # 00055-014-01 Task #
Project Manager Paul Schmidt
Laboratory NCA
Turn-around time: 2-8
Sampler's Name: John M. Greber
Sampler's Signature: John M. Greber

Analysis Request

Sample ID	Date	Time	Matrix	TPHg/BTEX 8015 (modified)/8020	TPHd 8015 (modified)	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals				Comments/ Instructions	Number of Containers
* EB-S-8		1515		X	X										2010169			FAX COPY	1
* EB-N-8		1520		X	X										2010170			to PM before	1
NB-E-8		1525		X	X										2010171			starting analysis	1
NB-W-8		1530		X	X													2010172	1
* WB-N-8		1535		X	X													2010173	1
* NB-S-8		1540		X	X													2010174	1

Special Instructions/Comments:
Job Name: CNG Sunnyside

Relinquished by:	Received by:
Sign John M. Greber	Sign Dana Heinz
Print John M. Greber	Print DANA HEINZ
Company SEACOR	Company NCA
Time 1620 Date 1/7/92	Time Date

Relinquished by:	Received by:
Sign	Sign
Print	Print
Company	Company
Time Date	Time Date

Sample Receipt

Total no. of containers:
Chain of custody seals:
Rec'd good condition/cold:
Conforms to record:

Client: Cascade Nat Gas
Client Contact: Paul S
Client Phone Number: (206) 646-0280

Date 1/7/92 Page 3 of 3

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101 • Bothell, WA 98011-2569
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SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01			
11040 Main Street, #240	Matrix:	Soil			
Bellevue, WA 98004	Analysis for:	Total Solids		Received:	Jan 8, 1992
Attention: Paul Schmidt	First Sample #:	201-0165		Reported:	Jan 9, 1992

LABORATORY ANALYSIS FOR: Total Solids

Sample Number	Sample Description	Sample Result %
201-0165	SP-1	90
201-0166	SP-2	91
201-0167	SP-3	90
201-0168	SP-4	88

North Creek Analytical routinely provides analytical results for soils, sediments or sludges in a wet weight "as received" basis.
To attain dry weight equivalents for regulatory compliance, divide the soil result by the decimal fraction of percent solids.

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Scot Cocanour
Laboratory Director

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SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01	Sampled:	Jan 7, 1992
11040 Main Street, #240	Matrix Descript:	Soil	Received:	Jan 8, 1992
Bellevue, WA 98004	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jan 8, 1992
Attention: Paul Schmidt	First Sample #:	201-0165	Reported:	Jan 9, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (WTPH-G/BTEX)

Sample Number	Sample Description	Purgeable Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)	Surrogate Recovery %
201-0165	SP-1	590 G-2	N.D.	N.D.	1.1	9.2	109
201-0166	SP-2	36 G-2	N.D.	N.D.	N.D.	N.D.	97
201-0167	SP-3	2.4 G-2	N.D.	N.D.	N.D.	N.D.	97
201-0168	SP-4	21 G-2	N.D.	N.D.	N.D.	N.D.	105
BLK010892	Method Blank	N.D.	N.D.	N.D.	N.D.	N.D.	97
Detection Limits:		**1.0**	**0.050**	**0.10**	**0.10**	**0.10**	

Purgeable Hydrocarbons are quantitated against a gasoline standard (nC5 - nC14). Surrogate recovery reported is for Bromofluorobenzene.
Analytes reported as N.D. were not present above the stated limit of detection.

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Please Note:
The detection limit for Benzene and Toluene in #201-0165 = 1.0 mg/kg.
The detection limit for Benzene in #201-0166 = 0.080 mg/kg.

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SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01		Sampled:	Jan 7, 1992
11040 Main Street, #240	Matrix Descript:	Soil		Received:	Jan 8, 1992
Bellevue, WA 98004	Analysis Method:	EPA 3550/8015		Extracted:	Jan 8, 1992
Attention: Paul Schmidt	First Sample #:	201-0165		Analyzed:	Jan 8-9, 1992
				Reported:	Jan 9, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS (WTPH-D)

Sample Number	Sample Description	Extractable Hydrocarbons mg/kg (ppm)	Surrogate Recovery %
201-0165	SP-1	82	125
201-0166	SP-2	650	85
201-0167	SP-3	24	100
201-0168	SP-4	48	120
BLK010892	Method Blank	N.D.	99

Detection Limits:	10

Extractable Hydrocarbons are quantitated against a diesel fuel standard (nC11 - nC24). Surrogate recovery reported is for Octacosane.
Analytes reported as N.D. were not present above the stated limit of detection.

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Laboratory Director

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HYDROCARBON ANALYSES FOOTNOTES

Code	Description
PURGEABLE HYDROCARBONS - Gasoline Range Organics	
G 1	The hydrocarbons present in this sample are primarily due to extractable diesel range organics.
G 2	The hydrocarbons present in this sample are a complex mixture of both gasoline range and diesel range organics.
G 3	The total hydrocarbon result in this sample is primarily due to a peak(s) eluting in the purgeable hydrocarbon range. Identification and quantitation by EPA 8010, 8021 or 8240 is recommended.
EXTRACTABLE HYDROCARBONS - Diesel Range Organics	
D 1	The hydrocarbons present in this sample are primarily due to purgeable gasoline range organics.
D 2	The hydrocarbons present in this sample are primarily due to very heavy, non-resolvable oil range organics. Quantitation by EPA 418.1 is recommended.
D 3	The hydrocarbons present in this sample are a complex mixture of purgeable gasoline, extractable diesel and non-resolvable oil range organics.
D 4	The hydrocarbon result shown is an estimated (greater than) value due to high concentration. Reanalysis is being performed to yield a quantitative result.

Oils & Lubricants
[------------------------------]
T.R.P.H. (418.1)

Diesel & Fuel Oils
[--]
Extractables (3550/8015)

Gasoline
[--------------------]
Purgeables (5030/8015)

LOW | **LOW TO MEDIUM** | **MEDIUM** | **MEDIUM TO HIGH** | **VERY HIGH**

HYDROCARBON BOILING POINT RANGE

CARBON RANGE:
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Paul Schmidt

Client Project ID: CNG Sunnyside 00058-014-01
Method : EPA 5030/8020
Sample Matrix : Soil
Units : mg/kg
QC Sample #: 201-0159

Analyst : R. Lister
S. Stowell

Analyzed: Jan 8, 1992
Reported: Jan 9, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl benzene	Xylenes
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.50	0.50	0.50	1.50
Conc. Matrix Spike:	0.32	0.33	0.40	1.16
Matrix Spike % Recovery:	64	66	80	77
Conc. Matrix Spike Dup.:	0.34	0.35	0.42	1.22
Matrix Spike Duplicate % Recovery:	68	70	84	81
Relative % Difference:	6.1	5.9	4.9	5.1

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% Recovery: $\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{(\text{Conc. of M.S. + Conc. of M.S.D.}) / 2} \times 100$

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SEACOR 11040 Main Street, #240 Bellevue, WA 98004 Attention: Paul Schmidt	Client Project ID: CNG Sunnyside 00058-014-01 Method : EPA 3510 or 3550/8015 Sample Matrix : Soil Units : mg/kg QC Sample #: BLK010892	Analyst : D. Harmon Extracted: Jan 8, 1992 Analyzed: Jan 9, 1992 Reported: Jan 9, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel Fuel
Sample Conc.:	N.D.
Spike Conc. Added:	44
Conc. Matrix Spike:	39
Matrix Spike % Recovery:	87
Conc. Matrix Spike Dup.:	40
Matrix Spike Duplicate % Recovery:	91
Relative % Difference:	2.5

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% Recovery: $\dfrac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}}$ x 100

Relative % Difference: $\dfrac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}}$ x 100

Chain-of-Custody Number: A 2092

SEACOR Chain-of-Custody Record

Address: SEACOR
11040 Main St Ste 240
Bellevue WA 98004

Project # C0058-014-C / Task #
Project Manager: Paul Schmidt
Laboratory: NCA
Turn-around time: 2-8

Sampler's Name: John M. Gieber
Sampler's Signature: John M. Gieber

Analysis Request

Sample ID	Date	Time	Matrix	TPHg/BTEX 8015 (modified)/8020	TPHd 8015 (modified)	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals				Comments/ Instructions	Number of Containers
EW-2-MS-6	1/7/92	0940	Soil	X	X										2010152			FAX Copy to	1
* EW2-N-7		1020		X	X										2010153			Paul before Starting	1
EW2-MN-6.5		1030		X	X										2010154			Analysis	1
* EW2-M-7		1035		X	X													2010155	1
VW2-W-7		1237		X	X													2010156	1
VW2-M-6.5		1410		X	X													2010157	1
* VW3-M-7		1500		X	X													2010158	1
* VW2-MW-7		1505		X	X													2010159	1
* VW2-ME-7		1510		X	X													2010160	1

Special Instructions/Comments:
Job name: CNG - Sunnyside

Relinquished by:	Received by:
Sign: John M. Gieber	Sign:
Print: John M. Gieber	Print:
Company: SEACOR	Company:
Time: 1620 Date: 1/7/92	Time: Date:

Relinquished by:	Received by:
Sign:	Sign:
Print:	Print:
Company:	Company:
Time: Date:	Time: Date:

Sample Receipt
Total no. of containers:
Chain of custody seals:
Rec'd good condition/cold:
Conforms to record:

Client: Cascade Nat. Gas
Client Contact: Paul S.
Client Phone Number: 206) 646 0280

Date 1/7/92 Page 1 of 3

Chain-of-Custody Number: A 209[illegible]

SEACOR Chain-of-Custody Record

Address: SEACOR
11040 Main St Ste 240
Bellevue WA 98004

Project # CCC58-014-01 Task #
Project Manager: Paul Schmidt
Laboratory: NCA
Turn-around time: 2-8

Sampler's Name: John M Gruber
Sampler's Signature: John M. Gruber

Analysis Request

Sample ID	Date	Time	Matrix	TPHg/BTEX 8015 (modified)/8020	TPHd 8015 (modified)	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals				Comments/ Instructions	Number of Containers
WW2-M-7	1/7/92	1300	Soil	X	X										2010161			Fax copy to P.M	1
WW2-MS-55		1325		X	X										2010162			before starting	1
WW2-S-7		1340		X	X										2010163			Analysis	1
SW Corner-7		1357		X	X													2010164	1
SP-1		1130		X	X													2010165	1
SP-2		1147		X	X													2010166	1
SP-3		1340		X	X													2010167	1
SP-4		1430		X	X													2010168	1

Special Instructions/Comments:
Job Name:
CNG - Sunnyside

Relinquished by:
Sign: John M. Gruber
Print: John M Gruber
Company: SEACOR
Time: 16:20 Date: 1/7/92

Received by:
Sign
Print
Company
Time Date

Relinquished by:
Sign
Print
Company
Time Date

Received by:
Sign
Print
Company
Time Date

Sample Receipt

Total no. of containers
Chain of custody seals:
Rec'd good condition/cold:
Conforms to record:

Client: Cascade Nat. Gas
Client Contact: Paul S.
Client Phone Number: (206) 646-0280

(X) - added 1:30p 1-8-92 KS

Date 1/7/92 Page 2 of 3

SEACOR Chain-of-Custody Record

Address: SEACOR
11040 Main St 541 240
Bellevue WA 98006

Project # CCC55-014-01 Task #
Project Manager Paul Schmidt
Laboratory NCA
Turn-around time: 2:8

Sampler's Name: John M. Greber
Sampler's Signature: John M. Gulu

Analysis Request

	Sample ID	Date	Time	Matrix	TPHg/BTEX 8015 (modified)/8020	TPHd 8015 (modified)	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals				Comments/ Instructions	Number of Containers
*	EB-S-S		1515		X	X										20	101	69	FAX COPY	1
*	EB-N-S		1520		X	X										20	101	70	to P.M. before	1
	NB-E-S		1525		X	X										20	101	71	starting analysis	1
	NB-W-S		1530		X	X													2010172	1
*	WB-N-S		1535		X	X													2010173	1
*	WB-S-S		1540		X	X													2010174	1

Special Instructions/Comments:
Job Name: CNG Sunnyside

Relinquished by:
Sign John M. Gulu
Print John M. Greber
Company SEACOR
Time 1620 Date 1/7/92

Received by:
Sign
Print
Company
Time Date

Relinquished by:
Sign
Print
Company
Time Date

Received by:
Sign
Print
Company
Time Date

Sample Receipt

Total no. of containers
Chain of custody seals:
Rec'd good condition/cold:
Conforms to record:

Cascade Nat Gas
Client:
Paul S
Client Contact:
(206) 646-0250
Client Phone Number:

Date 1/7/92 Page 3 of 3

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SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01		
11040 Main Street, #240	Sample Descript:	Method Blank		
Bellevue, WA 98004	Analysis Method:	EPA 8240/8260	Analyzed:	Jan 9, 1992
Attention: Paul Schmidt	Lab Number:	BLK010992	Reported:	Jan 9, 1992

VOLATILE ORGANICS by GC/MS (EPA 8240/8260)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acetone	0.50	1.0
Benzene	0.10	N.D.
Bromodichloromethane	0.10	N.D.
Bromoform	0.10	N.D.
Bromomethane	0.10	N.D.
2-Butanone	0.50	N.D.
Carbon disulfide	0.10	N.D.
Carbon tetrachloride	0.10	N.D.
Chlorobenzene	0.10	N.D.
Chloroethane	0.10	N.D.
2-Chloroethyl vinyl ether	0.50	N.D.
Chloroform	0.10	N.D.
Chloromethane	0.10	N.D.
Dibromochloromethane	0.10	N.D.
1,1-Dichloroethane	0.10	N.D.
1,2-Dichloroethane	0.10	N.D.
1,1-Dichloroethene	0.10	N.D.
Total 1,2-Dichloroethene	0.10	N.D.
1,2-Dichloropropane	0.10	N.D.
cis 1,3-Dichloropropene	0.10	N.D.
trans 1,3-Dichloropropene	0.10	N.D.
Ethylbenzene	0.10	N.D.
2-Hexanone	0.50	N.D.
Methylene chloride	0.50	1.4
4-Methyl-2-pentanone	0.50	N.D.
Styrene	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.10	N.D.
Tetrachloroethene	0.10	N.D.
Toluene	0.10	N.D.
1,1,1-Trichloroethane	0.10	N.D.
1,1,2-Trichloroethane	0.10	N.D.
Trichloroethene	0.10	N.D.
Trichlorofluoromethane	0.10	N.D.
Vinyl chloride	0.10	N.D.
Total Xylenes	0.10	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

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Laboratory Director

Surrogate Standards Percent Recovery:	
1,2-Dichloroethane-d4	102
Toluene-d8	90
4-Bromofluorobenzene	87

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SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01		Sampled:	Jan 7, 1992
11040 Main Street, #240	Sample Descript:	Soil, SP-2		Relogged:	Jan 8, 1992
Bellevue, WA 98004	Analysis Method:	EPA 8270		Extracted:	Jan 9, 1992
Attention: Paul Schmidt	Lab Number:	201-0166		Analyzed:	Jan 9, 1992
				Reported:	Jan 9, 1992

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acenaphthene	0.10	N.D.
Acenaphthylene	0.10	N.D.
Aniline	0.10	N.D.
Anthracene	0.10	N.D.
Benzidine	0.25	N.D.
Benzoic Acid	0.50	N.D.
Benzo(a)anthracene	0.10	N.D.
Benzo(b)fluoranthene	0.10	N.D.
Benzo(k)fluoranthene	0.10	N.D.
Benzo(g,h,i)perylene	0.10	N.D.
Benzo(a)pyrene	0.10	N.D.
Benzyl alcohol	0.10	N.D.
Bis(2-chloroethoxy)methane	0.10	N.D.
Bis(2-chloroethyl)ether	0.10	N.D.
Bis(2-chloroisopropyl)ether	0.10	N.D.
Bis(2-ethylhexyl)phthalate	0.50	N.D.
4-Bromophenyl phenyl ether	0.10	N.D.
Butyl benzyl phthalate	0.10	N.D.
4-Chloroaniline	0.10	N.D.
2-Chloronaphthalene	0.10	N.D.
4-Chloro-3-methylphenol	0.10	N.D.
2-Chlorophenol	0.10	N.D.
4-Chlorophenyl phenyl ether	0.10	N.D.
Chrysene	0.10	N.D.
Dibenz(a,h)anthracene	0.10	N.D.
Dibenzofuran	0.10	N.D.
Di-N-butyl phthalate	0.50	N.D.
1,3-Dichlorobenzene	0.10	N.D.
1,4-Dichlorobenzene	0.10	N.D.
1,2-Dichlorobenzene	0.10	N.D.
3,3-Dichlorobenzidine	0.50	N.D.
2,4-Dichlorophenol	0.10	N.D.
Diethyl phthalate	0.10	N.D.
2,4-Dimethylphenol	0.10	N.D.
Dimethyl phthalate	0.10	N.D.
4,6-Dinitro-2-methylphenol	0.50	N.D.
2,4-Dinitrophenol	0.50	N.D.

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SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01			
11040 Main Street, #240	Sample Descript:	Method Blank			
Bellevue, WA 98004	Analysis Method:	EPA 8270		Extracted:	Jan 9, 1992
Attention: Paul Schmidt	Lab Number:	BLK010992		Analyzed:	Jan 9, 1992
				Reported:	Jan 9, 1992

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acenaphthene	0.10	N.D.
Acenaphthylene	0.10	N.D.
Aniline	0.10	N.D.
Anthracene	0.10	N.D.
Benzidine	0.25	N.D.
Benzoic Acid	0.50	N.D.
Benzo(a)anthracene	0.10	N.D.
Benzo(b)fluoranthene	0.10	N.D.
Benzo(k)fluoranthene	0.10	N.D.
Benzo(g,h,i)perylene	0.10	N.D.
Benzo(a)pyrene	0.10	N.D.
Benzyl alcohol	0.10	N.D.
Bis(2-chloroethoxy)methane	0.10	N.D.
Bis(2-chloroethyl)ether	0.10	N.D.
Bis(2-chloroisopropyl)ether	0.10	N.D.
Bis(2-ethylhexyl)phthalate	0.50	N.D.
4-Bromophenyl phenyl ether	0.10	N.D.
Butyl benzyl phthalate	0.10	N.D.
4-Chloroaniline	0.10	N.D.
2-Chloronaphthalene	0.10	N.D.
4-Chloro-3-methylphenol	0.10	N.D.
2-Chlorophenol	0.10	N.D.
4-Chlorophenyl phenyl ether	0.10	N.D.
Chrysene	0.10	N.D.
Dibenz(a,h)anthracene	0.10	N.D.
Dibenzofuran	0.10	N.D.
Di-N-butyl phthalate	0.50	N.D.
1,3-Dichlorobenzene	0.10	N.D.
1,4-Dichlorobenzene	0.10	N.D.
1,2-Dichlorobenzene	0.10	N.D.
3,3-Dichlorobenzidine	0.50	N.D.
2,4-Dichlorophenol	0.10	N.D.
Diethyl phthalate	0.10	N.D.
2,4-Dimethylphenol	0.10	N.D.
Dimethyl phthalate	0.10	N.D.
4,6-Dinitro-2-methylphenol	0.50	N.D.
2,4-Dinitrophenol	0.50	N.D.

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SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01			
11040 Main Street, #240	Sample Descript:	Method Blank			
Bellevue, WA 98004	Analysis Method:	EPA 8270		Extracted:	Jan 9, 1992
Attention: Paul Schmidt	Lab Number:	BLK010992		Analyzed:	Jan 9, 1992
				Reported:	Jan 9, 1992

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
2,4-Dinitrotoluene	0.10	N.D.
2,6-Dinitrotoluene	0.10	N.D.
Di-N-octyl phthalate	0.10	N.D.
Fluoranthene	0.10	N.D.
Fluorene	0.10	N.D.
Hexachlorobenzene	0.10	N.D.
Hexachlorobutadiene.	0.10	N.D.
Hexachlorocyclopentadiene	0.10	N.D.
Hexachloroethane	0.10	N.D.
Indeno(1,2,3-cd)pyrene	0.10	N.D.
Isophorone	0.10	N.D.
2-Methylnaphthalene	0.10	N.D.
2-Methylphenol	0.10	N.D.
4-Methylphenol	0.10	N.D.
Naphthalene	0.10	N.D.
2-Nitroaniline	0.50	N.D.
3-Nitroaniline	0.50	N.D.
4-Nitroaniline	0.50	N.D.
Nitrobenzene	0.10	N.D.
2-Nitrophenol	0.10	N.D.
4-Nitrophenol	0.50	N.D.
N-Nitrosodiphenylamine	0.10	N.D.
N-Nitroso-di-N-propylamine	0.10	N.D.
Pentachlorophenol	0.50	N.D.
Phenanthrene	0.10	N.D.
Phenol	0.10	N.D.
Pyrene	0.10	N.D.
1,2,4-Trichlorobenzene	0.10	N.D.
2,4,5-Trichlorophenol	0.50	N.D.
2,4,6-Trichlorophenol	0.10	N.D.

Surrogate Standards Percent Recovery:

2-Fluorophenol	109	Nitrobenzene-d5	112
Phenol-d6	111	2-Fluorobiphenyl	118
2,4,6-Tribromophenol	128	Terphenyl-d14	156

Analytes reported as N.D. were not present above the stated limit of detection.

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Laboratory Director

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Paul Schmidt

Client Project ID: CNG Sunnyside 00058-014-01
Method : EPA 8240
Sample Matrix : Soil
Units : mg/kg
QC Sample #: 201-0166

Analyst : J. Kimball
Analyzed: Jan 9, 1992
Reported: Jan 9, 1992

QUALITY CONTROL DATA REPORT

Analyte	Sample Conc.	Spike Conc. Added	Conc. Matrix Spike	Matrix Spike % Recovery	Conc. Matrix Spike Duplicate	Matrix Spike Duplicate % Recovery	Relative % Difference
1,1-Dichloro-ethene	N.D.	2.0	1.6	80%	1.5	75%	6.5%
Trichloroethene	N.D.	2.0	1.7	85%	1.8	90%	5.7%
Benzene	N.D.	2.0	1.6	80%	1.6	80%	0.0%
Toluene	N.D.	2.0	1.8	90%	1.5	75%	18.2%
Chlorobenzene	N.D.	2.0	1.8	90%	1.8	90%	0.0%

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% Recovery: $\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}}$ x 100

Relative % Difference: $\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}}$ x 100

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SEACOR	Client Project ID: CNG Sunnyside 00058-014-01	Analyst :	G. Emory
11040 Main Street, #240	Method : EPA 8270		
Bellevue, WA 98004	Sample Matrix : Soil	Extracted:	Jan 9, 1992
Attention: Paul Schmidt	Units : mg/kg	Analyzed:	Jan 9, 1992
	QC Sample #: BLK010992	Reported:	Jan 9, 1992

QUALITY CONTROL DATA REPORT

Analyte	Sample Conc.	Spike Conc. Added	Conc. Matrix Spike	Matrix Spike % Recovery	Conc. Matrix Spike Duplicate	Matrix Spike Duplicate % Recovery	Relative % Difference
Phenol	N.D.	6.7	4.8	72%	5.2	78%	8.0%
2-Chlorophenol	N.D.	6.7	5.3	79%	5.8	87%	9.0%
1,4-Dichloro-benzene	N.D.	3.3	2.4	73%	2.5	76%	4.1%
N-Nitroso-Di-N-propylamine	N.D.	3.3	2.5	76%	2.7	82%	7.7%
1,2,4-Trichloro-benzene	N.D.	3.3	2.4	73%	2.6	79%	8.0%
4-Chloro-3-Methylphenol	N.D.	6.7	5.5	82%	5.7	85%	3.6%
Acenaphthene	N.D.	3.3	2.7	82%	2.9	88%	7.1%
4-Nitrophenol	N.D.	6.7	6.3	94%	6.6	99%	4.7%
2,4-Dinitro-toluene	N.D.	3.3	2.4	73%	2.4	73%	0.0%
Pentachloro-phenol	N.D.	6.7	6.1	91%	6.7	100%	9.4%
Pyrene	N.D.	3.3	3.0	91%	3.2	97%	6.5%

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% Recovery: $\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$

Chain-of-Custody Number: A 2093

SEACOR Chain-of-Custody Record

Address: SEACOR
11040 Main St Ste 240
Bellevue WA 98004

Project # CCC58-014-01 Task #
Project Manager Paul Schmidt
Laboratory NCA
Turn-around time: 2-5

Sampler's Name: John M Gruber
Sampler's Signature: John M. Gruber

Analysis Request

	Sample ID	Date	Time	Matrix	TPHg/BTEX 8015 (modified)/8020	TPHd 8015 (modified)	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals				Comments/ Instructions	Number of Containers
	MW2-M-7	1/7/92	1300	Soil	\	X										2010161			Fax copy to P.M.	1
X	MW2-MS-5.5		1325		\	X										2010162			before starting	1
X	MW2-S-7		1340		\	X			2-8hr TAT		2-8hr TAT					2010163			Analysis	1
	SW corner-7		1357		X	X													2010164	1
X	SP-1		1130		\	X													2010165	1
X	SP-2		1147		\	X			X		X								2010166	1
X	SP-3		1350		\	\			JMG		JMG		1638		KS 1-8-92 4:42				2010167	1
X	SP-4		1430		\	X			Relogged 1/8/92										2010168	1

Special Instructions/Comments:
Job Name:
CNG - Sunnyside

Relinquished by:	Received by:
Sign John M. Gruber	Sign Dana Heinz
Print John M Gruber	Print DANA HEINZ
Company SEACOR	Company NCA
Time 1620 Date 1/7/92	Time 10:30 Date 1/8/92

Relinquished by:	Received by:
Sign	Sign
Print	Print
Company	Company
Time Date	Time Date

Sample Receipt

Total no. of containers	23
Chain of custody seals:	N/A
Rec'd good condition/cold:	OK
Conforms to record:	

Client: Cascade Nat Gas
Client Contact: Paul S.
Client Phone Number: (206) 646-0280

Date 1/7/92 Page 2 of 3

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SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01			
11040 Main Street, #240	Matrix:	Soil			
Bellevue, WA 98004	Analysis for:	Total Solids		Received:	Jan 8, 1992
Attention: Paul Schmidt	First Sample #:	201-0212		Reported:	Jan 9, 1992

LABORATORY ANALYSIS FOR: Total Solids

Sample Number	Sample Description	Sample Result %
201-0212	NB-E2-8	85
201-0213	NB-W2-8	84
201-0214	SP-5	93
201-0215	SP-6	92
201-0216	SP-7	93
201-0217	SP-8	92

North Creek Analytical routinely provides analytical results for soils, sediments or sludges in a wet weight "as received" basis.
To attain dry weight equivalents for regulatory compliance, divide the soil result by the decimal fraction of percent solids.

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Laboratory Director

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SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01	Sampled:	Jan 8, 1992
11040 Main Street, #240	Matrix Descript:	Soil	Received:	Jan 8, 1992
Bellevue, WA 98004	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jan 8, 1992
Attention: Paul Schmidt	First Sample #:	201-0212	Reported:	Jan 9, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (WTPH-G/BTEX)

Sample Number	Sample Description	Purgeable Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)	Surrogate Recovery %
201-0212	NB-E2-8	1,400 G-2	0.57	N.D.	2.7	3.1	129
201-0213	NB-W2-8	8,500 G-2	9.8	N.D.	44	73	131
201-0214	SP-5	28 G-2	N.D.	N.D.	N.D.	N.D.	106
201-0215	SP-6	100 G-2	N.D.	N.D.	0.20	1.6	133
201-0216	SP-7	65 G-2	N.D.	N.D.	N.D.	0.28	119
201-0217	SP-8	610 G-2	N.D.	N.D.	2.2	3.8	116
BLK010892	Method Blank	N.D.	N.D.	N.D.	N.D.	N.D.	97
Detection Limits:		1.0	0.050	0.10	0.10	0.10	

Purgeable Hydrocarbons are quantitated against a gasoline standard (nC5 - nC14). Surrogate recovery reported is for Bromofluorobenzene.
Analytes reported as N.D. were not present above the stated limit of detection.

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Please Note:
The detection limit for Toluene in #201-0212 = 0.40 mg/kg.
The detection limit for Toluene in #201-0213 = 1.0 mg/kg.
The detection limit for Benzene and Toluene in #201-0217 = 0.40 mg/kg.

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HYDROCARBON ANALYSES FOOTNOTES

Code	Description
PURGEABLE HYDROCARBONS - Gasoline Range Organics	
G 1	The hydrocarbons present in this sample are primarily due to extractable diesel range organics.
G 2	The hydrocarbons present in this sample are a complex mixture of both gasoline range and diesel range organics.
G 3	The total hydrocarbon result in this sample is primarily due to a peak(s) eluting in the purgeable hydrocarbon range. Identification and quantitation by EPA 8010, 8021 or 8240 is recommended.
EXTRACTABLE HYDROCARBONS - Diesel Range Organics	
D 1	The hydrocarbons present in this sample are primarily due to purgeable gasoline range organics.
D 2	The hydrocarbons present in this sample are primarily due to very heavy, non-resolvable oil range organics. Quantitation by EPA 418.1 is recommended.
D 3	The hydrocarbons present in this sample are a complex mixture of purgeable gasoline, extractable diesel and non-resolvable oil range organics.
D 4	The hydrocarbon result shown is an estimated (greater than) value due to high concentration. Reanalysis is being performed to yield a quantitative result.

```
                                          Oils & Lubricants
                                   [------------------------------]
                                          T.R.P.H. (418.1)

                            Diesel & Fuel Oils
               [---------------------------------------]
                          Extractables (3550/8015)
     Gasoline
[--------------------]
Purgeables (5030/8015)
```

LOW LOW TO MEDIUM MEDIUM MEDIUM TO HIGH VERY HIGH

HYDROCARBON BOILING POINT RANGE

CARBON RANGE:

5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28

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SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01		Sampled:	Jan 8, 1992
11040 Main Street, #240	Matrix Descript:	Soil		Received:	Jan 8, 1992
Bellevue, WA 98004	Analysis Method:	EPA 3550/8015		Extracted:	Jan 8, 1992
Attention: Paul Schmidt	First Sample #:	201-0212		Analyzed:	Jan 8, 1992
				Reported:	Jan 9, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS (WTPH-D)

Sample Number	Sample Description	Extractable Hydrocarbons mg/kg (ppm)	Surrogate Recovery %
201-0212	NB-E2-8	1,700	NA
201-0213	NB-W2-8	1,100	NA
201-0214	SP-5	150 D2	NA
201-0215	SP-6	110	NA
201-0216	SP-7	75	89
201-0217	SP-8	370	103
BLK010892	Method Blank	N.D.	99

Detection Limits:	10

Extractable Hydrocarbons are quantitated against a diesel fuel standard (nC11 - nC24). Surrogate recovery reported is for Octacosane.
Analytes reported as N.D. were not present above the stated limit of detection.

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Laboratory Director

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HYDROCARBON ANALYSES FOOTNOTES

Code	Description
PURGEABLE HYDROCARBONS - Gasoline Range Organics	
G 1	The hydrocarbons present in this sample are primarily due to extractable diesel range organics.
G 2	The hydrocarbons present in this sample are a complex mixture of both gasoline range and diesel range organics.
G 3	The total hydrocarbon result in this sample is primarily due to a peak(s) eluting in the purgeable hydrocarbon range. Identification and quantitation by EPA 8010, 8021 or 8240 is recommended.
EXTRACTABLE HYDROCARBONS - Diesel Range Organics	
D 1	The hydrocarbons present in this sample are primarily due to purgeable gasoline range organics.
D 2	The hydrocarbons present in this sample are primarily due to very heavy, non-resolvable oil range organics. Quantitation by EPA 418.1 is recommended.
D 3	The hydrocarbons present in this sample are a complex mixture of purgeable gasoline, extractable diesel and non-resolvable oil range organics.
D 4	The hydrocarbon result shown is an estimated (greater than) value due to high concentration. Reanalysis is being performed to yield a quantitative result.

Oils & Lubricants
[-----------------------------]
T.R.P.H. (418.1)

Diesel & Fuel Oils
[-------------------------------------]
Extractables (3550/8015)

Gasoline
[--------------------]
Purgeables (5030/8015)

LOW **LOW TO MEDIUM** **MEDIUM** **MEDIUM TO HIGH** **VERY HIGH**
HYDROCARBON BOILING POINT RANGE

CARBON RANGE:
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28

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SEACOR	Client Project ID: CNG Sunnyside 00058-014-01	Sampled:	Jan 8, 1992
11040 Main Street, #240	Sample Descript: Soil, SP-8	Received:	Jan 8, 1992
Bellevue, WA 98004	Analysis Method: EPA 8240/8260	Analyzed:	Jan 9, 1992
Attention: Paul Schmidt	Lab Number: 201-0217	Reported:	Jan 9, 1992

VOLATILE ORGANICS by GC/MS (EPA 8240/8260)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acetone	0.50	2.4
Benzene	0.10	N.D.
Bromodichloromethane	0.10	N.D.
Bromoform	0.10	N.D.
Bromomethane	0.10	N.D.
2-Butanone	0.50	N.D.
Carbon disulfide	0.10	N.D.
Carbon tetrachloride	0.10	N.D.
Chlorobenzene	0.10	N.D.
Chloroethane	0.10	N.D.
2-Chloroethyl vinyl ether	0.50	N.D.
Chloroform	0.10	N.D.
Chloromethane	0.10	N.D.
Dibromochloromethane	0.10	N.D.
1,1-Dichloroethane	0.10	N.D.
1,2-Dichloroethane	0.10	N.D.
1,1-Dichloroethene	0.10	N.D.
Total 1,2-Dichloroethene	0.10	N.D.
1,2-Dichloropropane	0.10	N.D.
cis 1,3-Dichloropropene	0.10	N.D.
trans 1,3-Dichloropropene	0.10	N.D.
Ethylbenzene	0.10	0.53
2-Hexanone	0.50	N.D.
Methylene chloride	0.50	2.8
4-Methyl-2-pentanone	0.50	N.D.
Styrene	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.10	N.D.
Tetrachloroethene	0.10	N.D.
Toluene	0.10	N.D.
1,1,1-Trichloroethane	0.10	N.D.
1,1,2-Trichloroethane	0.10	N.D.
Trichloroethene	0.10	N.D.
Trichlorofluoromethane	0.10	N.D.
Vinyl chloride	0.10	N.D.
Total Xylenes	0.10	1.3

Analytes reported as N.D. were not present above the stated limit of detection.

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Please Note:
Acetone and Methylene Chloride are suspected laboratory contaminants.
Surrogate Recovery - 4-Bromofluorobenzene = 114
Surrogate Recovery - Toluene-d8 = 93
Surrogate Recovery - 1,2-Dichloroethane-d4 = 105

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SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01		
11040 Main Street, #240	Sample Descript:	Method Blank		
Bellevue, WA 98004	Analysis Method:	EPA 8240/8260	Analyzed:	Jan 9, 1992
Attention: Paul Schmidt	Lab Number:	BLK010992	Reported:	Jan 9, 1992

VOLATILE ORGANICS by GC/MS (EPA 8240/8260)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acetone	0.50	1.0
Benzene	0.10	N.D.
Bromodichloromethane	0.10	N.D.
Bromoform	0.10	N.D.
Bromomethane	0.10	N.D.
2-Butanone	0.50	N.D.
Carbon disulfide	0.10	N.D.
Carbon tetrachloride	0.10	N.D.
Chlorobenzene	0.10	N.D.
Chloroethane	0.10	N.D.
2-Chloroethyl vinyl ether	0.50	N.D.
Chloroform	0.10	N.D.
Chloromethane	0.10	N.D.
Dibromochloromethane	0.10	N.D.
1,1-Dichloroethane	0.10	N.D.
1,2-Dichloroethane	0.10	N.D.
1,1-Dichloroethene	0.10	N.D.
Total 1,2-Dichloroethene	0.10	N.D.
1,2-Dichloropropane	0.10	N.D.
cis 1,3-Dichloropropene	0.10	N.D.
trans 1,3-Dichloropropene	0.10	N.D.
Ethylbenzene	0.10	N.D.
2-Hexanone	0.50	N.D.
Methylene chloride	0.50	1.4
4-Methyl-2-pentanone	0.50	N.D.
Styrene	0.10	N.D.
1,1,2,2-Tetrachloroethane	0.10	N.D.
Tetrachloroethene	0.10	N.D.
Toluene	0.10	N.D.
1,1,1-Trichloroethane	0.10	N.D.
1,1,2-Trichloroethane	0.10	N.D.
Trichloroethene	0.10	N.D.
Trichlorofluoromethane	0.10	N.D.
Vinyl chloride	0.10	N.D.
Total Xylenes	0.10	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

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Surrogate Standards Percent Recovery:	
1,2-Dichloroethane-d4	102
Toluene-d8	90
4-Bromofluorobenzene	87

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SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01	Sampled:	Jan 8, 1992
11040 Main Street, #240	Sample Descript:	Soil, SP-8	Received:	Jan 8, 1992
Bellevue, WA 98004	Analysis Method:	EPA 8270	Extracted:	Jan 9, 1992
Attention: Paul Schmidt	Lab Number:	201-0217	Analyzed:	Jan 9, 1992
			Reported:	Jan 9, 1992

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acenaphthene	0.10	N.D.
Acenaphthylene	0.10	N.D.
Aniline	0.10	N.D.
Anthracene	0.10	N.D.
Benzidine	0.25	N.D.
Benzoic Acid	0.50	N.D.
Benzo(a)anthracene	0.10	N.D.
Benzo(b)fluoranthene	0.10	N.D.
Benzo(k)fluoranthene	0.10	N.D.
Benzo(g,h,i)perylene	0.10	N.D.
Benzo(a)pyrene	0.10	N.D.
Benzyl alcohol	0.10	N.D.
Bis(2-chloroethoxy)methane	0.10	N.D.
Bis(2-chloroethyl)ether	0.10	N.D.
Bis(2-chloroisopropyl)ether	0.10	N.D.
Bis(2-ethylhexyl)phthalate	0.50	N.D.
4-Bromophenyl phenyl ether	0.10	N.D.
Butyl benzyl phthalate	0.10	N.D.
4-Chloroaniline	0.10	N.D.
2-Chloronaphthalene	0.10	N.D.
4-Chloro-3-methylphenol	0.10	N.D.
2-Chlorophenol	0.10	N.D.
4-Chlorophenyl phenyl ether	0.10	N.D.
Chrysene	0.10	N.D.
Dibenz(a,h)anthracene	0.10	N.D.
Dibenzofuran	0.10	N.D.
Di-N-butyl phthalate	0.50	N.D.
1,3-Dichlorobenzene	0.10	N.D.
1,4-Dichlorobenzene	0.10	N.D.
1,2-Dichlorobenzene	0.10	N.D.
3,3-Dichlorobenzidine	0.50	N.D.
2,4-Dichlorophenol	0.10	N.D.
Diethyl phthalate	0.10	N.D.
2,4-Dimethylphenol	0.10	N.D.
Dimethyl phthalate	0.10	N.D.
4,6-Dinitro-2-methylphenol	0.50	N.D.
2,4-Dinitrophenol	0.50	N.D.

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SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01	Sampled:	Jan 8, 1992
11040 Main Street, #240	Sample Descript:	Soil, SP-8	Received:	Jan 8, 1992
Bellevue, WA 98004	Analysis Method:	EPA 8270	Extracted:	Jan 9, 1992
Attention: Paul Schmidt	Lab Number:	201-0217	Analyzed:	Jan 9, 1992
			Reported:	Jan 9, 1992

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
2,4-Dinitrotoluene	0.10	N.D.
2,6-Dinitrotoluene	0.10	N.D.
Di-N-octyl phthalate	0.10	N.D.
Fluoranthene	0.10	N.D.
Fluorene	0.10	N.D.
Hexachlorobenzene	0.10	N.D.
Hexachlorobutadiene.	0.10	N.D.
Hexachlorocyclopentadiene	0.10	N.D.
Hexachloroethane	0.10	N.D.
Indeno(1,2,3-cd)pyrene	0.10	N.D.
Isophorone	0.10	1.4
2-Methylnaphthalene	0.10	N.D.
2-Methylphenol	0.10	N.D.
4-Methylphenol	0.10	1.2
Naphthalene	0.10	N.D.
2-Nitroaniline	0.50	N.D.
3-Nitroaniline	0.50	N.D.
4-Nitroaniline	0.50	N.D.
Nitrobenzene	0.10	N.D.
2-Nitrophenol	0.10	N.D.
4-Nitrophenol	0.50	N.D.
N-Nitrosodiphenylamine	0.10	N.D.
N-Nitroso-di-N-propylamine	0.10	N.D.
Pentachlorophenol	0.50	N.D.
Phenanthrene	0.10	0.28
Phenol	0.10	N.D.
Pyrene	0.10	N.D.
1,2,4-Trichlorobenzene	0.10	N.D.
2,4,5-Trichlorophenol	0.50	N.D.
2,4,6-Trichlorophenol	0.10	N.D.

Surrogate Standards Percent Recovery:

2-Fluorophenol	137	Nitrobenzene-d5	121
Phenol-d6	126	2-Fluorobiphenyl	140
2,4,6-Tribromophenol	149	Terphenyl-d14	163

Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID: CNG Sunnyside 00058-014-01		
11040 Main Street, #240	Sample Descript: Method Blank		
Bellevue, WA 98004	Analysis Method: EPA 8270	Extracted:	Jan 9, 1992
Attention: Paul Schmidt	Lab Number: BLK010992	Analyzed:	Jan 9, 1992
		Reported:	Jan 9, 1992

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acenaphthene	0.10	N.D.
Acenaphthylene	0.10	N.D.
Aniline	0.10	N.D.
Anthracene	0.10	N.D.
Benzidine	0.25	N.D.
Benzoic Acid	0.50	N.D.
Benzo(a)anthracene	0.10	N.D.
Benzo(b)fluoranthene	0.10	N.D.
Benzo(k)fluoranthene	0.10	N.D.
Benzo(g,h,i)perylene	0.10	N.D.
Benzo(a)pyrene	0.10	N.D.
Benzyl alcohol	0.10	N.D.
Bis(2-chloroethoxy)methane	0.10	N.D.
Bis(2-chloroethyl)ether	0.10	N.D.
Bis(2-chloroisopropyl)ether	0.10	N.D.
Bis(2-ethylhexyl)phthalate	0.50	N.D.
4-Bromophenyl phenyl ether	0.10	N.D.
Butyl benzyl phthalate	0.10	N.D.
4-Chloroaniline	0.10	N.D.
2-Chloronaphthalene	0.10	N.D.
4-Chloro-3-methylphenol	0.10	N.D.
2-Chlorophenol	0.10	N.D.
4-Chlorophenyl phenyl ether	0.10	N.D.
Chrysene	0.10	N.D.
Dibenz(a,h)anthracene	0.10	N.D.
Dibenzofuran	0.10	N.D.
Di-N-butyl phthalate	0.50	N.D.
1,3-Dichlorobenzene	0.10	N.D.
1,4-Dichlorobenzene	0.10	N.D.
1,2-Dichlorobenzene	0.10	N.D.
3,3-Dichlorobenzidine	0.50	N.D.
2,4-Dichlorophenol	0.10	N.D.
Diethyl phthalate	0.10	N.D.
2,4-Dimethylphenol	0.10	N.D.
Dimethyl phthalate	0.10	N.D.
4,6-Dinitro-2-methylphenol	0.50	N.D.
2,4-Dinitrophenol	0.50	N.D.

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SEACOR	Client Project ID:	CNG Sunnyside 00058-014-01			
11040 Main Street, #240	Sample Descript:	Method Blank			
Bellevue, WA 98004	Analysis Method:	EPA 8270		Extracted:	Jan 9, 1992
Attention: Paul Schmidt	Lab Number:	BLK010992		Analyzed:	Jan 9, 1992
				Reported:	Jan 9, 1992

SEMI-VOLATILE ORGANICS by GC/MS (EPA 8270)

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
2,4-Dinitrotoluene	0.10	N.D.
2,6-Dinitrotoluene	0.10	N.D.
Di-N-octyl phthalate	0.10	N.D.
Fluoranthene	0.10	N.D.
Fluorene	0.10	N.D.
Hexachlorobenzene	0.10	N.D.
Hexachlorobutadiene.	0.10	N.D.
Hexachlorocyclopentadiene	0.10	N.D.
Hexachloroethane	0.10	N.D.
Indeno(1,2,3-cd)pyrene	0.10	N.D.
Isophorone	0.10	N.D.
2-Methylnaphthalene	0.10	N.D.
2-Methylphenol	0.10	N.D.
4-Methylphenol	0.10	N.D.
Naphthalene	0.10	N.D.
2-Nitroaniline	0.50	N.D.
3-Nitroaniline	0.50	N.D.
4-Nitroaniline	0.50	N.D.
Nitrobenzene	0.10	N.D.
2-Nitrophenol	0.10	N.D.
4-Nitrophenol	0.50	N.D.
N-Nitrosodiphenylamine	0.10	N.D.
N-Nitroso-di-N-propylamine	0.10	N.D.
Pentachlorophenol	0.50	N.D.
Phenanthrene	0.10	N.D.
Phenol	0.10	N.D.
Pyrene	0.10	N.D.
1,2,4-Trichlorobenzene	0.10	N.D.
2,4,5-Trichlorophenol	0.50	N.D.
2,4,6-Trichlorophenol	0.10	N.D.

Surrogate Standards Percent Recovery:

2-Fluorophenol	109	Nitrobenzene-d5	112
Phenol-d6	111	2-Fluorobiphenyl	118
2,4,6-Tribromophenol	128	Terphenyl-d14	156

Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR 11040 Main Street, #240 Bellevue, WA 98004 Attention: Paul Schmidt	Client Project ID: CNG Sunnyside 00058-014-01 Method : EPA 5030/8020 Sample Matrix : Soil Units : mg/kg QC Sample #: 201-0159	Analyst : Analyzed: Reported:	R. Lister S. Stowell Jan 8, 1992 Jan 9, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl benzene	Xylenes
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.50	0.50	0.50	1.50
Conc. Matrix Spike:	0.32	0.33	0.40	1.16
Matrix Spike % Recovery:	64	66	80	77
Conc. Matrix Spike Dup.:	0.34	0.35	0.42	1.22
Matrix Spike Duplicate % Recovery:	68	70	84	81
Relative % Difference:	6.1	5.9	4.9	5.1

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

% Recovery: $\dfrac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\dfrac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$

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SEACOR 11040 Main Street, #240 Bellevue, WA 98004 Attention: Paul Schmidt	Client Project ID: CNG Sunnyside 00058-014-01 Method : EPA 3510 or 3550/8015 Sample Matrix : Soil Units : mg/kg QC Sample #: BLK010892	Analyst : Extracted: Analyzed: Reported:	D. Harmon Jan 8, 1992 Jan 8, 1992 Jan 9, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel Fuel
Sample Conc.:	N.D.
Spike Conc. Added:	44
Conc. Matrix Spike:	39
Matrix Spike % Recovery:	87
Conc. Matrix Spike Dup.:	40
Matrix Spike Duplicate % Recovery:	91
Relative % Difference:	2.5

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

% Recovery: $\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Paul Schmidt

Client Project ID: CNG Sunnyside 00058-014-01
Method : EPA 8240
Sample Matrix : Soil
Units : mg/kg
QC Sample #: 201-0166

Analyst : G. Emory

Analyzed: Jan 9, 1992
Reported: Jan 9, 1992

QUALITY CONTROL DATA REPORT

Analyte	Sample Conc.	Spike Conc. Added	Conc. Matrix Spike	Matrix Spike % Recovery	Conc. Matrix Spike Duplicate	Matrix Spike Duplicate % Recovery	Relative % Difference
1,1-Dichloro-ethene	N.D.	2.0	1.6	80%	1.5	75%	6.5%
Trichloroethene	N.D.	2.0	1.7	85%	1.8	90%	5.7%
Benzene	N.D.	2.0	1.6	80%	1.6	80%	0.0%
Toluene	N.D.	2.0	1.8	90%	1.5	75%	18.2%
Chlorobenzene	N.D.	2.0	1.8	90%	1.8	90%	0.0%

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

% Recovery: $\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Paul Schmidt

Client Project ID: CNG Sunnyside 00058-014-01
Method : EPA 8270
Sample Matrix : Soil
Units : mg/kg
QC Sample #: BLK010992

Analyst : G. Emory
Extracted: Jan 9, 1992
Analyzed: Jan 9, 1992
Reported: Jan 9, 1992

QUALITY CONTROL DATA REPORT

Analyte	Sample Conc.	Spike Conc. Added	Conc. Matrix Spike	Matrix Spike % Recovery	Conc. Matrix Spike Duplicate	Matrix Spike Duplicate % Recovery	Relative % Difference
Phenol	N.D.	6.7	4.8	72%	5.2	78%	8.0%
2-Chlorophenol	N.D.	6.7	5.3	79%	5.8	87%	9.0%
1,4-Dichloro-benzene	N.D.	3.3	2.4	73%	2.5	76%	4.1%
N-Nitroso-Di-N-propylamine	N.D.	3.3	2.5	76%	2.7	82%	7.7%
1,2,4-Trichloro-benzene	N.D.	3.3	2.4	73%	2.6	79%	8.0%
4-Chloro-3-Methylphenol	N.D.	6.7	5.5	82%	5.7	85%	3.6%
Acenaphthene	N.D.	3.3	2.7	82%	2.9	88%	7.1%
4-Nitrophenol	N.D.	6.7	6.3	94%	6.6	99%	4.7%
2,4-Dinitro-toluene	N.D.	3.3	2.4	73%	2.4	73%	0.0%
Pentachloro-phenol	N.D.	6.7	6.1	91%	6.7	100%	9.4%
Pyrene	N.D.	3.3	3.0	91%	3.2	97%	6.5%

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

% Recovery: $\dfrac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}}$ x 100

Relative % Difference: $\dfrac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}}$ x 100

Chain-of-Custody Number: A 208

SEACOR Chain-of-Custody Record

Address: SEACOR
11040 Main St Ste 104
Bellevue WA 98004

Project # 00058-014-01 Task #
Project Manager Paul Schmidt
Laboratory NCA
Turn-around time: 2-8
Sampler's Name: John M. Greber
Sampler's Signature: John M. Greber

Sample ID	Date	Time	Matrix	TPHg/BTEX 8015 (modified)/8020	TPHd 8015 (modified)	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals				Comments/ Instructions	Number of Containers
NB-E2-8	1/8/92	1155	Soil	X	X													PID=220 2010212	1
NB-W2-8		1200		X	X													PID=180 + 213	1
SP-5		1220		X	X													2010214	1
SP-6		1225		X	X													215	1
SP-7		1230		X	X													216	1
SP-8		1235		X	X			X		X								217	1

Special Instructions/Comments:
Job Name: CNG-Sunnyside

Relinquished by:	Received by:
Sign John M. Greber	Sign Kimberle Stark
Print John M. Greber	Print Kimberle Stark
Company SEACOR	Company NCA
Time 1640 Date 1/8/92	Time 4:42 Date 1-8-92

Relinquished by:	Received by:
Sign	Sign
Print	Print
Company	Company
Time Date	Time Date

Sample Receipt

Total no. of containers	6
Chain of custody seals:	
Rec'd good condition/cold:	✓
Conforms to record:	✓

Client: Cascade Nat. Gas
Client Contact: Paul S.
Client Phone Number: (206) 646-0280

Date 1/8/92 Page 1 of 1

NORTH CREEK ANALYTICAL

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SEACOR	Client Project ID:	00058-014-01		Sampled:	Dec 18, 1991
11040 Main Street, #240	Matrix Descript:	Soil		Received:	Dec 19, 1991
Bellevue, WA 98004	Analysis Method:	Qualitative GC-FID		Extracted:	Dec 19, 1991
Attention: Paul Schmidt	First Sample #:	112-0712		Analyzed:	Dec 21, 1991
				Reported:	Dec 30, 1991

HYDROCARBON IDENTIFICATION (WTPH-HCID)

Sample Number	Sample Description	HCID as Gasoline mg/kg (ppm)	HCID as Diesel mg/kg (ppm)	Surrogate Recovery %
112-0712	Quarry #1	<20	<50	75
112-0713	Quarry #2	<20	<50	70

HCID as gasoline are hydrocarbons between nC7 and nC11. HCID as diesel are hydrocarbons between nC11 and nC24.
If Hydrocarbons greater than 20 ppm as gasoline or greater than 50 ppm as diesel are reported as "Present", proceed to WTPH-G or WTPH-D for accurate quantitation.

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

Chain-of-Custody Number: A 2094

SEACOR Chain-of-Custody Record

Address:
SEACOR
11040 Main St., Ste 240
Bellevue, WA 98004

Project # 00058-014-01 Task # /
Project Manager P. Schmidt
Laboratory North Creek Analytical
Turn-around time: 5-Day TAT

Sampler's Name: John Gieber & P. Schmidt
Sampler's Signature: P. Schmidt

Analysis Request

Sample ID	Date	Time	Matrix	TPHg/BTEX 8015 (modified)/8020	TPHd 8015 (modified)	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals	WTPH-HCID			Comments/ Instructions	Number of Containers
MW-1	12-17-91	1145	H_2O	✓	✓				✓									Lab ID	
MW-2	12-17-91	1245	H_2O	✓	✓				✓									1120709	5
MW-3	12-17-91	1430	H_2O	✓	✓				✓									710	5
																		711	5
Quarry # 1	12-18-91	0900	Soil																
Quarry # 2	12-18-91	0900	Soil												✓			712	1
															✓			713	1
Rinse Blank -	Not recorded			✓					✓										
	on Chain	TC																714	1

Special Instructions/Comments:

* 5 DAY TAT - Results due by 12-30-91

Relinquished by:
Sign Paul F. Schmidt
Print PAUL Schmidt
Company SEACOR
Time 1225 Date 12-19-91

Received by:
Sign
Print
Company
Time Date

Relinquished by:
Sign
Print
Company
Time Date

Received by:
Sign T. Collier
Print T. Collier
Company NCA
Time 3:00 Date 12/19/91

Sample Receipt

Total no. of containers 18
Chain of custody seals: ok
Rec'd good condition/cold: ok
Conforms to record: NO

Client:
Client Contact:
Client Phone Number:

2100

Date 12/19/91 Page 1 of 1

JULY 1993
RI/FS SAMPLING

NORTH CREEK ANALYTICAL

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SEACOR	Client Project ID:	CNG, #00058-019-01		
11040 Main Street, #240	Sample Matrix:	Soil		
Bellevue, WA 98004			Received:	Jul 23, 1993
Attention: Gordon Shaffer	First Sample #:	307-0789	Reported:	Aug 6, 1993

TOTAL SOLIDS & MOISTURE CONTENT REPORT

Sample Number	Sample Description	Total Solids %	Moisture Content %
307-0789	MW-4 @ 9.5'	70	30
307-0790	MW-5 @ 13.5'	79	21
307-0791	MW-6 @ 9'	81	19
307-0792	MW-7 @ 10'	82	18
307-0793	MW-8 @ 9'	82	18

The enclosed analytical results for soils, sediments and sludges have been converted to a DRY WEIGHT reporting basis.
To attain the wet weight "as received" equivalent, multiply the dry weight result by the decimal fraction of percent Total Solids.
The results in this report apply to the samples analyzed in accordance with the chain of custody document.
This analytical report must be reproduced in its entirety.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID: CNG, #00058-019-01	Sampled:	Jul 20, 1993
11040 Main Street, #240	Sample Matrix: Soil	Received:	Jul 23, 1993
Bellevue, WA 98004	Analysis Method: WTPH-G	Analyzed:	Jul 27, 1993
Attention: Gordon Shaffer	First Sample #: 307-0789	Reported:	Aug 6, 1993

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE

Sample Number	Sample Description	Sample Result mg/kg (ppm)	Surrogate Recovery %
307-0789	MW-4 @ 9.5' 7/19/93	3.7	97
307-0790	MW-5 @ 13.5' 7/19/93	78	91
307-0791	MW-6 @ 9'	N.D.	96
307-0792	MW-7 @ 10'	N.D.	95
307-0793	MW-8 @ 9'	N.D.	99
BLK072793	Method Blank	N.D.	110

Reporting Limits	1.0

4-Bromofluorobenzene surrogate recovery control limits are 50 - 150 %.
Volatile Total Petroleum Hydrocarbons are quantitated as Gasoline Range Organics (toluene - dodecane).
Analytes reported as N.D. were not detected above the stated Reporting Limit. The results reported above are on a dry weight basis.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101• Bothell, WA 98011-2569
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SEACOR	Client Project ID: CNG, #00058-019-01	Sampled:	Jul 20, 1993
11040 Main Street, #240	Sample Matrix: Soil	Received:	Jul 23, 1993
Bellevue, WA 98004	Analysis Method: EPA 8020	Analyzed:	Jul 27, 1993
Attention: Gordon Shaffer	First Sample #: 307-0789	Reported:	Aug 6, 1993

BTEX DISTINCTION

Sample Number	Sample Description	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)	Surrogate Recovery %
307-0789	MW-4 @ 9.5' 7/19/93	0.54	N.D.	0.079	N.D.	98
307-0790	MW-5 @ 13.5' 7/19/93	N.D.	N.D.	0.12	0.16	110
307-0791	MW-6 @ 9'	N.D.	N.D.	N.D.	N.D.	100
307-0792	MW-7 @ 10'	N.D.	N.D.	N.D.	N.D.	99
307-0793	MW-8 @ 9'	N.D.	N.D.	N.D.	N.D.	99
BLK072793	Method Blank	N.D.	N.D.	N.D.	N.D.	110
Reporting Limits:		**0.050**	**0.050**	**0.050**	**0.10**	

4-Bromofluorobenzene surrogate recovery control limits are 79 - 165 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.
The results reported above are on a dry weight basis.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Matthew T. Essig
Project Manager

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID:	CNG, #00058-019-01		Sampled:	Jul 20, 1993
11040 Main Street, #240	Sample Matrix:	Soil		Received:	Jul 23, 1993
Bellevue, WA 98004	Analysis Method:	WTPH-D		Extracted:	Jul 27, 1993
Attention: Gordon Shaffer	First Sample #:	307-0789		Analyzed:	Jul 27-28, 1993
				Reported:	Aug 6, 1993

TOTAL PETROLEUM HYDROCARBONS-DIESEL RANGE

Sample Number	Sample Description	Sample Result mg/kg (ppm)	Surrogate Recovery %
307-0789	MW-4 @ 9.5' 7/19/93	N.D.	89
307-0790	MW-5 @ 13.5' 7/19/93	N.D.	120
307-0791	MW-6 @ 9'	N.D.	71
307-0792	MW-7 @ 10'	N.D.	90
307-0793	MW-8 @ 9'	N.D.	91
BLK072793	Method Blank	N.D.	95

Reporting Limit:	10

2-Fluorobiphenyl surrogate recovery control limits are 50 - 150 %.
Extractable Total Petroleum Hydrocarbons are quantitated as Diesel Range Organics (C12 - C24).
Analytes reported as N.D. were not detected above the stated Reporting Limit. The results reported above are on a dry weight basis.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID:	CNG, #00058-019-01		Sampled:	Jul 22, 1993
11040 Main Street, #240	Sample Matrix:	Water		Received:	Jul 23, 1993
Bellevue, WA 98004	Analysis Method:	WTPH-G		Analyzed:	Jul 26, 1993
Attention: Gordon Shaffer	First Sample #:	307-0794		Reported:	Aug 6, 1993

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE

Sample Number	Sample Description	Sample Result µg/L (ppb)	Surrogate Recovery %
307-0794	CD EAST 7/21/93	N.D.	98
307-0795	CD WEST 7/21/93	N.D.	110
307-0796	RINSATE BLANK	N.D.	110
307-0798	MW-1	330	130
307-0799	MW-2	N.D.	110
307-0800	MW-3	5,200	100
307-0801	MW-4	4,100	130
307-0802	MW-5	5,700	120
307-0803	MW-6	N.D.	100
307-0804	MW-7	N.D.	100

Reporting Limit:	50

4-Bromofluorobenzene surrogate recovery control limits are 50 - 150 %.
Volatile Total Petroleum Hydrocarbons are quantitated as Gasoline Range Organics (toluene - dodecane).
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101· Bothell, WA 98011-2569
Phone (206) 481-9200 · FAX (206) 485-2992

SEACOR	Client Project ID:	CNG, #00058-019-01	Sampled:	Jul 22, 1993
11040 Main Street, #240	Sample Matrix:	Water	Received:	Jul 23, 1993
Bellevue, WA 98004	Analysis Method:	WTPH-G	Analyzed:	Jul 26, 1993
Attention: Gordon Shaffer	First Sample #:	307-0805	Reported:	Aug 6, 1993

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE

Sample Number	Sample Description	Sample Result μg/L (ppb)	Surrogate Recovery %
307-0805	MW-8	N.D.	100
BLK072693	Method Blank	N.D.	110

Reporting Limit:	50

4-Bromofluorobenzene surrogate recovery control limits are 50 - 150 %.
Volatile Total Petroleum Hydrocarbons are quantitated as Gasoline Range Organics (toluene - dodecane).
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

NORTH
CREEK
ANALYTICAL

18939 120th Avenue N.E., Suite 101• Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID:	CNG, #00058-019-01	Sampled:	Jul 22, 1993
11040 Main Street, #240	Sample Matrix:	Water	Received:	Jul 23, 1993
Bellevue, WA 98004	Analysis Method:	EPA 8020	Analyzed:	Jul 26, 1993
Attention: Gordon Shaffer	First Sample #:	307-0794	Reported:	Aug 6, 1993

BTEX DISTINCTION

Sample Number	Sample Description	Benzene μg/L (ppb)	Toluene μg/L (ppb)	Ethyl Benzene μg/L (ppb)	Xylenes μg/L (ppb)	Surrogate Recovery %
307-0794	CD EAST 7/21/93	N.D.	N.D.	0.73	N.D.	100
307-0795	CD WEST 7/21/93	2.7	N.D.	1.2	N.D.	110
307-0796	RINSATE BLANK	N.D.	N.D.	N.D.	N.D.	100
307-0797	TRIP BLANK 7/15/93	N.D.	N.D.	N.D.	N.D.	110
307-0798	MW-1	3.2	1.0	9.0	4.0	120
307-0799	MW-2	N.D.	N.D.	N.D.	N.D.	110
307-0800	MW-3	2,900	260	240	280	110
307-0801	MW-4	120	7.6	95	65	120
307-0802	MW-5	78	26	180	240	110
307-0803	MW-6	N.D.	N.D.	N.D.	N.D.	100
Reporting Limits:		**0.50**	**0.50**	**0.50**	**1.0**	

4-Bromofluorobenzene surrogate recovery control limits are 83 - 157 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

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Project Manager

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SEACOR	Client Project ID:	CNG, #00058-019-01		Sampled:	Jul 22, 1993
11040 Main Street, #240	Sample Matrix:	Water		Received:	Jul 23, 1993
Bellevue, WA 98004	Analysis Method:	EPA 8020		Analyzed:	Jul 26, 1993
Attention: Gordon Shaffer	First Sample #:	307-0804		Reported:	Aug 6, 1993

BTEX DISTINCTION

Sample Number	Sample Description	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)	Surrogate Recovery %
307-0804	MW-7	N.D.	N.D.	N.D.	N.D.	100
307-0805	MW-8	N.D.	N.D.	N.D.	N.D.	100
BLK072693	Method Blank	N.D.	N.D.	N.D.	N.D.	100
Reporting Limits:		0.50	0.50	0.50	1.0	

4-Bromofluorobenzene surrogate recovery control limits are 83 - 157 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

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SEACOR	Client Project ID: CNG, #00058-019-01	Sampled:	Jul 22, 1993
11040 Main Street, #240	Sample Matrix: Water	Received:	Jul 23, 1993
Bellevue, WA 98004	Analysis Method: WTPH-D	Extracted:	Jul 27, 1993
Attention: Gordon Shaffer	First Sample #: 307-0794	Analyzed:	Jul 27-29, 1993
		Reported:	Aug 6, 1993

TOTAL PETROLEUM HYDROCARBONS-DIESEL RANGE

Sample Number	Sample Description	Sample Result mg/L (ppm)	Surrogate Recovery %
307-0794	CD EAST 7/21/93	N.D.	120
307-0795	CD WEST 7/21/93	0.82	98
307-0796	RINSATE BLANK	N.D.	110
307-0798	MW-1	0.30	100
307-0799	MW-2	N.D.	100
307-0800	MW-3	7.9 D-1	110
307-0801	MW-4	1.2 D-1	100
307-0802	MW-5	1.1 D-1	98
307-0803	MW-6	N.D.	100
307-0804	MW-7	N.D.	98

Reporting Limit:	**0.25**

2-Fluorobiphenyl surrogate recovery control limits are 50 - 150 %.
Extractable Total Petroleum Hydrocarbons are quantitated as Diesel Range Organics (C12 - C24).
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

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Project Manager

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SEACOR	Client Project ID:	CNG, #00058-019-01	Sampled:	Jul 22, 1993
11040 Main Street, #240	Sample Matrix:	Water	Received:	Jul 23, 1993
Bellevue, WA 98004	Analysis Method:	WTPH-D	Extracted:	Jul 27, 1993
Attention: Gordon Shaffer	First Sample #:	307-0805	Analyzed:	Jul 27-29, 1993
			Reported:	Aug 6, 1993

TOTAL PETROLEUM HYDROCARBONS-DIESEL RANGE

Sample Number	Sample Description	Sample Result mg/L (ppm)	Surrogate Recovery %
307-0805	MW-8	N.D.	98
BLK072793	Method Blank	N.D.	98

Reporting Limit:	0.25

2-Fluorobiphenyl surrogate recovery control limits are 50 - 150 %.
Extractable Total Petroleum Hydrocarbons are quantitated as Diesel Range Organics (C12 - C24).
Analytes reported as N.D. were not detected above the stated Reporting Limit.

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SEACOR 11040 Main Street, #240 Bellevue, WA 98004 Attention: Gordon Shaffer	Client Project ID: CNG, #00058-019-01 Sample Matrix: Soil Analysis Method: EPA 8020 Units: mg/kg (ppm) QC Sample #: 307-0832	Analyst: Analyzed: Reported:	R. Lister K. Wilke F. Shino Jul 27, 1993 Aug 6, 1993

MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Sample Result:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.50	0.50	0.50	1.5
Spike Result:	0.47	0.49	0.51	1.5
Spike % Recovery:	94%	98%	102%	100%
Spike Dup. Result:	0.44	0.46	0.47	1.4
Spike Duplicate % Recovery:	88%	92%	94%	93%
Upper Control Limit %:	102	102	108	112
Lower Control Limit %:	70	70	74	71
Relative % Difference:	6.6%	6.3%	8.2%	6.9%
Maximum RPD:	11	13	12	13

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result - Sample Result}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Spike Result - Spike Dup. Result}}{\text{(Spike Result + Spike Dup. Result) / 2}} \times 100$

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG, #00058-019-01
Sample Matrix: Soil
Analysis Method: WTPH-G
Units: mg/kg (ppm)

Analyst: R. Lister
K. Wilke
F. Shino
Analyzed: Jul 27, 1993
Reported: Aug 6, 1993

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Gasoline	
Spike Conc. Added:	5.0
Spike Result:	4.6
% Recovery:	92
Upper Control Limit %:	120
Lower Control Limit %:	80

PRECISION ASSESSMENT
Sample Duplicate

Gasoline Range Hydrocarbons	
Sample Number:	307-0789
Original Result:	3.7
Duplicate Result:	3.9
Relative % Difference	Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.
Maximum RPD:	50

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

% Recovery: $\dfrac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\dfrac{\text{Original Result - Duplicate Result}}{(\text{Original Result + Duplicate Result}) \;/\; 2} \times 100$

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG, #00058-019-01
Sample Matrix: Soil
Analysis Method: WTPH-D
Units: mg/kg (ppm)

Analyst: D. Anderson

Extracted: Jul 27, 1993
Analyzed: Jul 27, 1993
Reported: Aug 6, 1993

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Diesel

Spike Conc. Added:	67
Spike Result:	72
% Recovery:	107
Upper Control Limit %:	120
Lower Control Limit %:	80

PRECISION ASSESSMENT
Sample Duplicate

Diesel Range Hydrocarbons

Sample Number:	307-0789
Original Result:	N.D.
Duplicate Result:	N.D.
Relative % Difference	Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.
Maximum RPD:	50

NORTH CREEK ANALYTICAL Inc

Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result - Duplicate Result}}{\text{(Original Result + Duplicate Result) / 2}} \times 100$

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG, #00058-019-01
Sample Matrix: Water
Analysis Method: EPA 8020
Units: μg/L (ppb)
QC Sample #: 307-0797

Analyst: R. Lister
K. Wilke

Analyzed: Jul 26, 1993
Reported: Aug 6, 1993

MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Sample Result:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	5.0	5.0	5.0	15
Spike Result:	5.6	5.2	5.5	15
Spike % Recovery:	112%	104%	110%	100%
Spike Dup. Result:	5.2	5.0	5.0	13
Spike Duplicate % Recovery:	104%	100%	100%	0.87 Q1
Upper Control Limit %:	123	118	126	114
Lower Control Limit %:	87	89	88	92
Relative % Difference:	7.4%	3.8%	0.091 Q1	0.14 Q1
Maximum RPD:	8.3	7.9	8.0	12

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

Please Note:
Q1 = The Spike recovery for this Q.C. sample is outside of NCA established control limits.

NORTH CREEK ANALYTICAL

18939 120th Avenue N.E., Suite 101• Bothell, WA 98011-2569
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SEACOR 11040 Main Street, #240 Bellevue, WA 98004 Attention: Gordon Shaffer	Client Project ID: CNG, #00058-019-01 Sample Matrix: Water Analysis Method: WTPH-G Units: μg/L (ppb)	Analyst: Analyzed: Reported:	R. Lister K. Wilke Jul 26, 1993 Aug 6, 1993

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

	Gasoline
Spike Conc. Added:	100
Spike Result:	90
% Recovery:	90
Upper Control Limit %:	120
Lower Control Limit %:	80

PRECISION ASSESSMENT
Sample Duplicate

	Gasoline Range Organics
Sample Number:	307-0804
Original Result:	N.D.
Duplicate Result:	N.D.
Relative % Difference	Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.
Maximum RPD:	20

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Matthew T. Essig
Project Manager

% Recovery: $\dfrac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\dfrac{\text{Original Result - Duplicate Result}}{\text{(Original Result + Duplicate Result) / 2}} \times 100$

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG, #00058-019-01
Sample Matrix: Water
Analysis Method: WTPH-D
Units: mg/L (ppm)

Analyst: D. Anderson

Extracted: Jul 27, 1993
Analyzed: Jul 27, 1993
Reported: Aug 6, 1993

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

	Diesel
Spike Conc. Added:	2.1
Spike Result:	2.1
% Recovery:	100
Upper Control Limit %:	110
Lower Control Limit %:	74

PRECISION ASSESSMENT
Sample Duplicate

	Diesel Range Organics
Sample Number:	307-0794
Original Result:	N.D.
Duplicate Result:	N.D.
Relative % Difference	Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.
Maximum RPD:	39

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result - Duplicate Result}}{\text{(Original Result + Duplicate Result) / 2}} \times 100$

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HYDROCARBON ANALYSES FOOTNOTES

(8/92)

Code	Description
	VOLATILE HYDROCARBONS - Gasoline Range Organics
G 1	This sample appears to contain extractable diesel range organics.
G 2	The chromatogram for this sample is not a typical gasoline fingerprint.
G 3	The total hydrocarbon result in this sample is primarily due to a peak(s) eluting in the volatile hydrocarbon range. Identification and quantitation by EPA 8010, 8021 or 8240 is recommended.
	EXTRACTABLE HYDROCARBONS - Diesel Range Organics
D 1	This sample appears to contain volatile gasoline range organics.
D 2	The hydrocarbons present in this sample are primarily due to very heavy, non-resolvable oil range organics. Quantitation by EPA 418.1 is recommended.
D 3	The hydrocarbons present in this sample are a complex mixture of extractable diesel range and non-resolvable motor oil or other heavy oil range organics.
D 4	The hydrocarbon result shown is an estimated (greater than) value due to high concentration. Reanalysis is being performed to yield a quantitative result.

Oils & Lubricants
[--]
T.R.P.H. (418.1)

Diesel & Fuel Oils
[--]
Extractables (3550/8015)

Gasoline
[--------------------------------]
Volatiles (5030/8015)

HYDROCARBON BOILING POINT RANGE

LOW LOW TO MEDIUM MEDIUM MEDIUM TO HIGH VERY HIGH

CARBON RANGE:

5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 +

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID:	CNG, #00058-019-01		Sampled:	Jul 22, 1993
11040 Main Street, #240	Sample Matrix:	Water		Received:	Jul 23, 1993
Bellevue, WA 98004	Analysis Method:	WTPH-G		Analyzed:	Jul 26, 1993
Attention: Gordon Shaffer	First Sample #:	307-0806		Reported:	Aug 5, 1993

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE

Sample Number	Sample Description	Sample Result μg/L (ppb)	Surrogate Recovery %
307-0806	PURGE H2O DRUM	N.D.	107
BLK072693	Method Blank	N.D.	99

Reporting Limit:	50

4-Bromofluorobenzene surrogate recovery control limits are 50 - 150 %.
Volatile Total Petroleum Hydrocarbons are quantitated as Gasoline Range Organics (toluene - dodecane).
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

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Project Manager

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SEACOR	Client Project ID:	CNG, #00058-019-01		Sampled:	Jul 22, 1993
11040 Main Street, #240	Sample Matrix:	Water		Received:	Jul 23, 1993
Bellevue, WA 98004	Analysis Method:	EPA 8020		Analyzed:	Jul 26, 1993
Attention: Gordon Shaffer	First Sample #:	307-0806		Reported:	Aug 5, 1993

BTEX DISTINCTION

Sample Number	Sample Description	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)	Surrogate Recovery %
307-0806	PURGE H2O DRUM	N.D.	N.D.	N.D.	N.D.	103
BLK072693	Method Blank	N.D.	N.D.	N.D.	N.D.	100
Reporting Limits:		0.50	0.50	0.50	1.0	

4-Bromofluorobenzene surrogate recovery control limits are 83 - 157 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
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SEACOR	Client Project ID:	CNG, #00058-019-01		Sampled:	Jul 22, 1993
11040 Main Street, #240	Sample Matrix:	Water		Received:	Jul 23, 1993
Bellevue, WA 98004	Analysis Method:	WTPH-D		Extracted:	Jul 28, 1993
Attention: Gordon Shaffer	First Sample #:	307-0806		Analyzed:	Jul 29-30, 1993
				Reported:	Aug 5, 1993

TOTAL PETROLEUM HYDROCARBONS-DIESEL RANGE

Sample Number	Sample Description	Sample Result mg/L (ppm)	Surrogate Recovery %
307-0806	PURGE H2O DRUM	0.39	88
BLK072893	Method Blank	N.D.	79

Reporting Limit:	0.25

2-Fluorobiphenyl surrogate recovery control limits are 50 - 150 %.
Extractable Total Petroleum Hydrocarbons are quantitated as Diesel Range Organics (C12 - C24).
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG, #00058-019-01
Sample Matrix: Water
Analysis Method: EPA 8020
Units: µg/L (ppb)
QC Sample #: 307-0797

Analyst: R. Lister
K. Wilke

Analyzed: Jul 26, 1993
Reported: Aug 5, 1993

MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Sample Result:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	5.0	5.0	5.0	15
Spike Result:	5.6	5.2	5.5	15
Spike % Recovery:	112%	104%	110%	100%
Spike Dup. Result:	5.2	5.0	5.0	13
Spike Duplicate % Recovery:	104%	100%	100%	87%, Q-1
Upper Control Limit %:	123	118	126	114
Lower Control Limit %:	87	89	88	92
Relative % Difference:	7.4%	3.8%	9.1%, Q-6	14%, Q-6
Maximum RPD:	8.3	7.9	8.0	12

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

Please Note:
Q-1 = The Spike Recovery for this QC sample is outside of the NCA established control limits.
Q-6 = The RPD value for this QC sample is outside of the NCA established control limits.

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG, #00058-019-01
Sample Matrix: Water
Analysis Method: WTPH-G
Units: $\mu g/L$ (ppb)

Analyst: R. Lister
K. Wilke

Analyzed: Jul 26, 1993
Reported: Aug 5, 1993

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Gasoline	
Spike Conc. Added:	100
Spike Result:	90
% Recovery:	90
Upper Control Limit %:	120
Lower Control Limit %:	80

PRECISION ASSESSMENT
Sample Duplicate

Gasoline Range Organics	
Sample Number:	307-0804
Original Result:	N.D.
Duplicate Result:	N.D.
Relative % Difference	Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.
Maximum RPD:	20

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result - Duplicate Result}}{\text{(Original Result + Duplicate Result) / 2}} \times 100$

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR 11040 Main Street, #240 Bellevue, WA 98004 Attention: Gordon Shaffer	Client Project ID: CNG, #00058-019-01 Sample Matrix: Water Analysis Method: WTPH-D Units: mg/L (ppm)	Analyst: D. Anderson Extracted: Jul 28, 1993 Analyzed: Jul 29-30, 1993 Reported: Aug 5, 1993

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

	Diesel
Spike Conc. Added:	2.1
Spike Result:	2.2
% Recovery:	105
Upper Control Limit %:	110
Lower Control Limit %:	74

PRECISION ASSESSMENT
Sample Duplicate

	Diesel Range Organics
Sample Number:	307-0806
Original Result:	0.39
Duplicate Result:	0.41
Relative % Difference	5.0
Maximum RPD:	39

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result - Duplicate Result}}{(\text{Original Result + Duplicate Result}) / 2} \times 100$

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18939 120th Avenue N.E., Suite 101• Bothell, WA 98011-2569
Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID: CNG, #00058-019-01	Sampled:	Jul 22, 1993
11040 Main Street, #240	Sample Matrix: Water	Received:	Jul 23, 1993
Bellevue, WA 98004	Analysis Method: WTPH-G	Analyzed:	Jul 26, 1993
Attention: Gordon Shaffer	First Sample #: 307-0806	Reported:	Aug 5, 1993

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE

Sample Number	Sample Description	Sample Result µg/L (ppb)	Surrogate Recovery %
307-0806	PURGE H2O DRUM	N.D.	107
BLK072693	Method Blank	N.D.	99

Reporting Limit:	50

4-Bromofluorobenzene surrogate recovery control limits are 50 - 150 %.
Volatile Total Petroleum Hydrocarbons are quantitated as Gasoline Range Organics (toluene - dodecane).
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

NORTH CREEK ANALYTICAL

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Phone (206) 481-9200 • FAX (206) 485-2992

SEACOR	Client Project ID:	CNG, #00058-019-01	Sampled:	Jul 22, 1993
11040 Main Street, #240	Sample Matrix:	Water	Received:	Jul 23, 1993
Bellevue, WA 98004	Analysis Method:	EPA 8020	Analyzed:	Jul 26, 1993
Attention: Gordon Shaffer	First Sample #:	307-0806	Reported:	Aug 5, 1993

BTEX DISTINCTION

Sample Number	Sample Description	Benzene μg/L (ppb)	Toluene μg/L (ppb)	Ethyl Benzene μg/L (ppb)	Xylenes μg/L (ppb)	Surrogate Recovery %
307-0806	PURGE H2O DRUM	N.D.	N.D.	N.D.	N.D.	103
BLK072693	Method Blank	N.D.	N.D.	N.D.	N.D.	100

Reporting Limits:	0.50	0.50	0.50	1.0

4-Bromofluorobenzene surrogate recovery control limits are 83 - 157 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

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SEACOR	Client Project ID:	CNG, #00058-019-01		Sampled:	Jul 22, 1993
11040 Main Street, #240	Sample Matrix:	Water		Received:	Jul 23, 1993
Bellevue, WA 98004	Analysis Method:	WTPH-D		Extracted:	Jul 28, 1993
Attention: Gordon Shaffer	First Sample #:	307-0806		Analyzed:	Jul 29-30, 1993
				Reported:	Aug 5, 1993

TOTAL PETROLEUM HYDROCARBONS-DIESEL RANGE

Sample Number	Sample Description	Sample Result mg/L (ppm)	Surrogate Recovery %
307-0806	PURGE H2O DRUM	0.39	88
BLK072893	Method Blank	N.D.	79

Reporting Limit:	0.25

2-Fluorobiphenyl surrogate recovery control limits are 50 - 150 %.
Extractable Total Petroleum Hydrocarbons are quantitated as Diesel Range Organics (C12 - C24).
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG, #00058-019-01
Sample Matrix: Water
Analysis Method: EPA 8020
Units: µg/L (ppb)
QC Sample #: 307-0797

Analyst: R. Lister
K. Wilke

Analyzed: Jul 26, 1993
Reported: Aug 5, 1993

MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Sample Result:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	5.0	5.0	5.0	15
Spike Result:	5.6	5.2	5.5	15
Spike % Recovery:	112%	104%	110%	100%
Spike Dup. Result:	5.2	5.0	5.0	13
Spike Duplicate % Recovery:	104%	100%	100%	87%, Q-1
Upper Control Limit %:	123	118	126	114
Lower Control Limit %:	87	89	88	92
Relative % Difference:	7.4%	3.8%	9.1%, Q-6	14%, Q-6
Maximum RPD:	8.3	7.9	8.0	12

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Please Note:
Q-1 = The Spike Recovery for this QC sample is outside of the NCA established control limits.
Q-6 = The RPD value for this QC sample is outside of the NCA established control limits.

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SEACOR 11040 Main Street, #240 Bellevue, WA 98004 Attention: Gordon Shaffer	Client Project ID: CNG, #00058-019-01 Sample Matrix: Water Analysis Method: WTPH-G Units: $\mu g/L$ (ppb)	Analyst: Analyzed: Reported:	R. Lister K. Wilke Jul 26, 1993 Aug 5, 1993

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Gasoline	
Spike Conc. Added:	100
Spike Result:	90
% Recovery:	90
Upper Control Limit %:	120
Lower Control Limit %:	80

PRECISION ASSESSMENT
Sample Duplicate

Gasoline Range Organics	
Sample Number:	307-0804
Original Result:	N.D.
Duplicate Result:	N.D.
Relative % Difference	Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.
Maximum RPD:	20

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Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result - Duplicate Result}}{\text{(Original Result + Duplicate Result) / 2}} \times 100$

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SEACOR 11040 Main Street, #240 Bellevue, WA 98004 Attention: Gordon Shaffer	Client Project ID: CNG, #00058-019-01 Sample Matrix: Water Analysis Method: WTPH-D Units: mg/L (ppm)	Analyst: D. Anderson Extracted: Jul 28, 1993 Analyzed: Jul 29-30, 1993 Reported: Aug 5, 1993

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

	Diesel
Spike Conc. Added:	2.1
Spike Result:	2.2
% Recovery:	105
Upper Control Limit %:	110
Lower Control Limit %:	74

PRECISION ASSESSMENT
Sample Duplicate

	Diesel Range Organics
Sample Number:	307-0806
Original Result:	0.39
Duplicate Result:	0.41
Relative % Difference	5.0
Maximum RPD:	39

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result - Duplicate Result}}{(\text{Original Result + Duplicate Result}) / 2} \times 100$

Chain-of-Custody Number: A 32[illegible]

SEACOR Chain-of-Custody Record

Address: 11040 Main St. Ste 240
Bellevue WA 98004
206 646-0280

CASCADE Natural Gas
512 Decatur Ave
Sunnyside WA

Project # 00058-019-01 Task # 0401
Project Manager Gordon Shaffer
Laboratory NCA
Turn-around time: Standard
Sampler's Name: John M. Gieber
Sampler's Signature: John M. Gieber

Analysis Request

Sample ID	Date	Time	Matrix	WTPHg/BTEX 8015 (modified)/8020	WTPHd ~~8015 (modified)~~	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals				Comments/ Instructions	Number of Containers
Purge H_2O Drum	7/22/93	1445	H_2O	X	X													3070806	3

Special Instructions/Comments:

Relinquished by:	Received by:
Sign John M. Gieber	Sign Dana Heine
Print John M. Gieber	Print DANA HEINE
Company SEACOR	Company NCA
Time 1050 Date 7/23/93	Time 1240 Date 7/23/93

Relinquished by:	Received by:
Sign	Sign
Print	Print
Company	Company
Time Date	Time Date

Sample Receipt

Total no. of containers	3
Chain of custody seals:	N
Rec'd good condition/cold:	ok
Conforms to record:	ok

Client:

Client Contact:

Client Phone Number:

Date 7/23/93 Page 1 of 1

JULY 1994
RI/FS SAMPLING

NORTH CREEK ANALYTICAL

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SEACOR 11040 Main Street, #240 Bellevue, WA 98004 Attention: Gordon Shaffer	Client Project ID: Sample Matrix: First Sample #:	CNG Sunnyside, #00058-019-01 Soil 407-0627	Received: Jul 18, 1994 Reported: Aug 2, 1994

TOTAL SOLIDS & MOISTURE CONTENT REPORT

Sample Number	Sample Description	Total Solids %	Moisture Content %
407-0627	MW-9 (4.5)	86	14
407-0628	MW-9 (10.5 - 11.0)	64	36
407-0629	MW-10 (4.5 - 5.0)	85	15
407-0630	MW-10 (9.5 - 10.0)	72	28
407-0631	MW-11 (5.0 - 5.5)	84	16
407-0632	MW-11 (10.5 - 11.0)	69	31

The enclosed analytical results for soils, sediments and sludges have been converted to a DRY WEIGHT reporting basis.
To attain the wet weight "as received" equivalent, multiply the dry weight result by the decimal fraction of percent Total Solids.
The results in this report apply to the samples analyzed in accordance with the chain of custody document.
This analytical report must be reproduced in its entirety.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 15, 1994
11040 Main Street, #240	Sample Matrix:	Soil	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	WTPH-G	Analyzed:	Jul 19, 1994
Attention: Gordon Shaffer	First Sample #:	407-0627	Reported:	Aug 2, 1994

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE

Sample Number	Sample Description	Sample Result mg/kg (ppm)	Surrogate Recovery %
407-0627	MW-9 (4.5)	N.D.	88
407-0628	MW-9 (10.5 - 11.0)	N.D.	80
407-0629	MW-10 (4.5 - 5.0)	N.D.	88
407-0630	MW-10 (9.5 - 10.0)	N.D.	83
407-0631	MW-11 (5.0 - 5.5)	N.D.	91
407-0632	MW-11 (10.5 - 11.0)	N.D.	83
BLK071994	Method Blank	N.D.	96

Reporting Limits	50

4-Bromofluorobenzene surrogate recovery control limits are 50 - 150 %.
Volatile Total Petroleum Hydrocarbons are quantitated as Gasoline Range Organics (toluene - dodecane).
Analytes reported as N.D. were not detected above the stated Reporting Limit. The results reported above are on a dry weight basis.

NORTH CREEK ANALYTICAL Inc.

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG Sunnyside, #00058-019-01
Sample Matrix: Soil
Analysis Method: WTPH-G
Units: mg/kg (ppm)

Analyst: R. Lister
F. Shino

Analyzed: Jul 19, 1994
Reported: Aug 2, 1994

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Gasoline	
Spike Conc. Added:	5.0
Spike Result:	4.1
% Recovery:	82
Upper Control Limit %:	113
Lower Control Limit %:	65

PRECISION ASSESSMENT
Sample Duplicate

Gasoline Range Hydrocarbons	
Sample Number:	407-0627
Original Result:	N.D.
Duplicate Result:	N.D.
Relative % Difference	Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.
Maximum RPD:	65

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

% Recovery: $\dfrac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\dfrac{\text{Original Result - Duplicate Result}}{(\text{Original Result + Duplicate Result}) / 2} \times 100$

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG Sunnyside, #00058-019-01
Sample Matrix: Soil
Analysis Method: WTPH-D
First Sample #: 407-0627

Sampled: Jul 15, 1994
Received: Jul 18, 1994
Extracted: Jul 19, 1994
Analyzed: Jul 21, 1994
Reported: Aug 2, 1994

TOTAL PETROLEUM HYDROCARBONS-DIESEL RANGE

Sample Number	Sample Description	Sample Result mg/kg (ppm)	Surrogate Recovery %
407-0627	MW-9 (4.5)	N.D.	57
407-0628	MW-9 (10.5 - 11.0)	N.D.	57
407-0629	MW-10 (4.5 - 5.0)	N.D.	52
407-0630	MW-10 (9.5 - 10.0)	N.D.	66
407-0631	MW-11 (5.0 - 5.5)	N.D.	66
407-0632	MW-11 (10.5 - 11.0)	N.D.	67
BLK071994	Method Blank	N.D.	61

Reporting Limit:	100

2-Fluorobiphenyl surrogate recovery control limits are 50 - 150 %.
Extractable Total Petroleum Hydrocarbons are quantitated as Diesel Range Organics (C12 - C24).
Analytes reported as N.D. were not detected above the stated Reporting Limit. The results reported above are on a dry weight basis.

NORTH CREEK ANALYTICAL Inc.

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG Sunnyside, #00058-019-01
Sample Matrix: Soil
Analysis Method: WTPH-D
Units: mg/kg (ppm)

Analyst: D. Anderson
Extracted: Jul 19, 1994
Analyzed: Jul 21, 1994
Reported: Aug 2, 1994

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Diesel	
Spike Conc. Added:	74
Spike Result:	70
% Recovery:	95
Upper Control Limit %:	118
Lower Control Limit %:	81

PRECISION ASSESSMENT
Sample Duplicate

Diesel Range Hydrocarbons	
Sample Number:	407-0627
Original Result:	N.D.
Duplicate Result:	N.D.
Relative % Difference	Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.
Maximum RPD:	45

NORTH CREEK ANALYTICAL Inc

Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result - Duplicate Result}}{(\text{Original Result + Duplicate Result}) / 2} \times 100$

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SEACOR	Client Project ID: CNG Sunnyside, #00058-019-01	Sampled:	Jul 15, 1994
11040 Main Street, #240	Sample Descript: Soil, MW-9 (4.5)	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method: EPA 8240	Analyzed:	Jul 28, 1994
Attention: Gordon Shaffer	Sample Number: 407-0627	Reported:	Aug 2, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acetone	4,000	N.D.
Benzene	0.25	N.D.
1,1-Dichloroethane	4,000	N.D.
1,2-Dichloroethane	5.0	N.D.
Ethylbenzene	10	N.D.
Methylene chloride	0.25	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	10	N.D.
Total Xylenes	10	N.D.

The results reported above are on a dry weight basis.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	115	70-121
Toluene-d8	102	81-117
4-Bromofluorobenzene	92	74-121

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SEACOR	Client Project ID: CNG Sunnyside, #00058-019-01	Sampled:	Jul 15, 1994
11040 Main Street, #240	Sample Descript: Soil, MW-9 (10.5 - 11.0)	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method: EPA 8240	Analyzed:	Jul 28, 1994
Attention: Gordon Shaffer	Sample Number: 407-0628	Reported:	Aug 2, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acetone	4,000	N.D.
Benzene	0.25	N.D.
1,1-Dichloroethane	4,000	N.D.
1,2-Dichloroethane	5.0	N.D.
Ethylbenzene	10	N.D.
Methylene chloride	0.25	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	10	N.D.
Total Xylenes	10	N.D.

The results reported above are on a dry weight basis.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	120	70-121
Toluene-d8	101	81-117
4-Bromofluorobenzene	92	74-121

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 15, 1994
11040 Main Street, #240	Sample Descript:	Soil, MW-10 (4.5 - 5.0)	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8240	Analyzed:	Jul 28, 1994
Attention: Gordon Shaffer	Sample Number:	407-0629	Reported:	Aug 2, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acetone	4,000	N.D.
Benzene	0.25	N.D.
1,1-Dichloroethane	4,000	N.D.
1,2-Dichloroethane	5.0	N.D.
Ethylbenzene	10	N.D.
Methylene chloride	0.25	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	10	N.D.
Total Xylenes	10	N.D.

The results reported above are on a dry weight basis.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	115	70-121
Toluene-d8	100	81-117
4-Bromofluorobenzene	92	74-121

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 15, 1994
11040 Main Street, #240	Sample Descript:	Soil, MW-10 (9.5 - 10.0)	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8240	Analyzed:	Jul 28, 1994
Attention: Gordon Shaffer	Sample Number:	407-0630	Reported:	Aug 2, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acetone	4,000	N.D.
Benzene	0.25	N.D.
1,1-Dichloroethane	4,000	N.D.
1,2-Dichloroethane	5.0	N.D.
Ethylbenzene	10	N.D.
Methylene chloride	0.25	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	10	N.D.
Total Xylenes	10	N.D.

The results reported above are on a dry weight basis.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	112	70-121
Toluene-d8	101	81-117
4-Bromofluorobenzene	92	74-121

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15055 S.W. Sequoia Parkway, Suite 110 • Portland, OR 97224-7155 (503) 624-9800 • FAX 684-3782

SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 15, 1994
11040 Main Street, #240	Sample Descript:	Soil, MW-11 (5.0 - 5.5)	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8240	Analyzed:	Jul 28, 1994
Attention: Gordon Shaffer	Sample Number:	407-0631	Reported:	Aug 2, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acetone	4,000	N.D.
Benzene	0.25	N.D.
1,1-Dichloroethane	4,000	N.D.
1,2-Dichloroethane	5.0	N.D.
Ethylbenzene	10	N.D.
Methylene chloride	0.25	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	10	N.D.
Total Xylenes	10	N.D.

The results reported above are on a dry weight basis.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

~~Matthew T. Essig~~
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	116	70-121
Toluene-d8	100	81-117
4-Bromofluorobenzene	92	74-121

NORTH CREEK ANALYTICAL

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15055 S.W. Sequoia Parkway, Suite 110 • Portland, OR 97224-7155 (503) 624-9800 • FAX 684-3782

SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01		Sampled:	Jul 15, 1994
11040 Main Street, #240	Sample Descript:	Soil, MW-11 (10.5 - 11.0)		Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8240		Analyzed:	Jul 28, 1994
Attention: Gordon Shaffer	Sample Number:	407-0632		Reported:	Aug 2, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acetone	4,000	N.D.
Benzene	0.25	N.D.
1,1-Dichloroethane	4,000	N.D.
1,2-Dichloroethane	5.0	N.D.
Ethylbenzene	10	N.D.
Methylene chloride	0.25	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	10	N.D.
Total Xylenes	10	N.D.

The results reported above are on a dry weight basis.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

for Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	116	70-121
Toluene-d8	100	81-117
4-Bromofluorobenzene	94	74-121

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01		
11040 Main Street, #240	Sample Descript:	Method Blank		
Bellevue, WA 98004	Analysis Method:	EPA 8240	Analyzed:	Jul 28, 1994
Attention: Gordon Shaffer	Sample Number:	BLK072894	Reported:	Aug 2, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Acetone	4,000	N.D.
Benzene	0.25	N.D.
1,1-Dichloroethane	4,000	N.D.
1,2-Dichloroethane	5.0	N.D.
Ethylbenzene	10	N.D.
Methylene chloride	0.25	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	10	N.D.
Total Xylenes	10	N.D.

The results reported above are on a dry weight basis.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	110	70-121
Toluene-d8	101	81-117
4-Bromofluorobenzene	92	74-121

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG Sunnyside, #00058-019-01
Sample Matrix: Soil
Analysis Method: EPA 8240
Units: mg/kg (ppm)
QC Sample #: 407-0631

Analyst: K. Wilke

Analyzed: Jul 28, 1994
Reported: Aug 2, 1994

MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	1,1-DCE	Benzene	TCE	Toluene	Chloro-benzene
Sample Result:	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	2.38	2.38	2.38	2.38	2.38
Spike Result:	1.51	1.93	1.69	1.96	1.92
Spike % Recovery:	63%	81%	71%	82%	81%
Spike Dup. Result:	1.48	1.95	1.71	1.98	1.96
Spike Duplicate % Recovery:	62%	82%	72%	83%	82%
Upper Control Limit %:	94	102	99	113	103
Lower Control Limit %:	47	71	67	60	71
Relative % Difference:	2.0%	1.0%	1.2%	1.0%	2.1%
Maximum RPD:	11	12	10	23	10

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Results - Sample Result}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Spike Result - Spike Dup. Result}}{\text{(Spike Result + Spike Dup. Result) / 2}} \times 100$

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01		Sampled:	Jul 15, 1994
11040 Main Street, #240	Sample Descript:	Soil, MW-9 (4.5)		Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8270		Analyzed:	Jul 21, 1994
Attention: Gordon Shaffer	Sample Number:	407-0627		Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Butylbenzyl phthalate	600	N.D.
Bis(2-ethylhexyl)phthalate	35	N.D.
Di-n-octyl phthalate	800	N.D.
Di-ethyl phthalate	32,000	N.D.
Di-n-butyl phthalate	4,000	N.D.
Dibenzofuran	0.10	N.D.
Naphthalene	160	N.D.
2-Methylnaphthalene	0.10	N.D.
Pentachlorophenol	**4.0**	**5.2**
Isophorone	500	N.D.
Phenanthrene	0.50	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	73	25-121	Nitrobenzene-d5	63	23-120
Phenol-d6	76	24-113	2-Fluorobiphenyl	68	30-115
2,4,6-Tribromophenol	59	19-122	p-Terphenyl-d14	93	18-137

The results reported above are on a dry weight basis.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 15, 1994
11040 Main Street, #240	Sample Descript:	Soil, MW-9 (10.5 - 11.0)	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8270	Analyzed:	Jul 21, 1994
Attention: Gordon Shaffer	Sample Number:	407-0628	Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Butylbenzyl phthalate	600	N.D.
Bis(2-ethylhexyl)phthalate	35	N.D.
Di-n-octyl phthalate	800	N.D.
Di-ethyl phthalate	32,000	N.D.
Di-n-butyl phthalate	4,000	N.D.
Dibenzofuran	0.25	N.D.
Naphthalene	160	N.D.
2-Methylnaphthalene	0.25	N.D.
Pentachlorophenol	4.0	N.D.
Isophorone	500	N.D.
Phenanthrene	0.50	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	103	25-121	Nitrobenzene-d5	74	23-120
Phenol-d6	97	24-113	2-Fluorobiphenyl	92	30-115
2,4,6-Tribromophenol	67	19-122	p-Terphenyl-d14	108	18-137

The results reported above are on a dry weight basis.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

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SEACOR	Client Project ID: CNG Sunnyside, #00058-019-01	Sampled:	Jul 15, 1994
11040 Main Street, #240	Sample Descript: Soil, MW-10 (4.5 - 5.0)	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method: EPA 8270	Analyzed:	Jul 21, 1994
Attention: Gordon Shaffer	Sample Number: 407-0629	Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Butylbenzyl phthalate	600	N.D.
Bis(2-ethylhexyl)phthalate	35	N.D.
Di-n-octyl phthalate	800	N.D.
Di-ethyl phthalate	32,000	N.D.
Di-n-butyl phthalate	4,000	N.D.
Dibenzofuran	0.10	N.D.
Naphthalene	160	N.D.
2-Methylnaphthalene	0.10	N.D.
Pentachlorophenol	4.0	N.D.
Isophorone	500	N.D.
Phenanthrene	0.50	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	86	25-121	Nitrobenzene-d5	64	23-120
Phenol-d6	80	24-113	2-Fluorobiphenyl	72	30-115
2,4,6-Tribromophenol	63	19-122	p-Terphenyl-d14	90	18-137

The results reported above are on a dry weight basis.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

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Matthew T. Essig
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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01		Sampled:	Jul 15, 1994
11040 Main Street, #240	Sample Descript:	Soil, MW-10 (9.5 - 10.0)		Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8270		Analyzed:	Jul 22, 1994
Attention: Gordon Shaffer	Sample Number:	407-0630		Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Butylbenzyl phthalate	600	N.D.
Bis(2-ethylhexyl)phthalate	35	N.D.
Di-n-octyl phthalate	800	N.D.
Di-ethyl phthalate	32,000	N.D.
Di-n-butyl phthalate	4,000	N.D.
Dibenzofuran	0.20	N.D.
Naphthalene	160	N.D.
2-Methylnaphthalene	0.20	N.D.
Pentachlorophenol	4.0	N.D.
Isophorone	500	N.D.
Phenanthrene	0.50	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	93	25-121	Nitrobenzene-d5	80	23-120
Phenol-d6	82	24-113	2-Fluorobiphenyl	78	30-115
2,4,6-Tribromophenol	61	19-122	p-Terphenyl-d14	105	18-137

The results reported above are on a dry weight basis.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
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SEACOR	Client Project ID: CNG Sunnyside, #00058-019-01	Sampled:	Jul 15, 1994
11040 Main Street, #240	Sample Descript: Soil, MW-11 (5.0 - 5.5)	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method: EPA 8270	Analyzed:	Jul 22, 1994
Attention: Gordon Shaffer	Sample Number: 407-0631	Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Butylbenzyl phthalate	600	N.D.
Bis(2-ethylhexyl)phthalate	35	N.D.
Di-n-octyl phthalate	800	N.D.
Di-ethyl phthalate	32,000	N.D.
Di-n-butyl phthalate	4,000	N.D.
Dibenzofuran	0.20	N.D.
Naphthalene	160	N.D.
2-Methylnaphthalene	0.20	N.D.
Pentachlorophenol	4.0	N.D.
Isophorone	500	N.D.
Phenanthrene	0.50	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	81	25-121	Nitrobenzene-d5	73	23-120
Phenol-d6	74	24-113	2-Fluorobiphenyl	74	30-115
2,4,6-Tribromophenol	60	19-122	p-Terphenyl-d14	100	18-137

The results reported above are on a dry weight basis.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 15, 1994
11040 Main Street, #240	Sample Descript:	Soil, MW-11 (10.5 - 11.0)	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8270	Analyzed:	Jul 22, 1994
Attention: Gordon Shaffer	Sample Number:	407-0632	Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Butylbenzyl phthalate	600	N.D.
Bis(2-ethylhexyl)phthalate	35	N.D.
Di-n-octyl phthalate	800	N.D.
Di-ethyl phthalate	32,000	N.D.
Di-n-butyl phthalate	4,000	N.D.
Dibenzofuran	0.20	N.D.
Naphthalene	160	N.D.
2-Methylnaphthalene	0.20	N.D.
Pentachlorophenol	4.0	N.D.
Isophorone	500	N.D.
Phenanthrene	0.50	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	97	25-121	Nitrobenzene-d5	85	23-120
Phenol-d6	87	24-113	2-Fluorobiphenyl	86	30-115
2,4,6-Tribromophenol	56	19-122	p-Terphenyl-d14	99	18-137

The results reported above are on a dry weight basis.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01		
11040 Main Street, #240	Sample Descript:	Method Blank		
Bellevue, WA 98004	Analysis Method:	EPA 8270	Analyzed:	Jul 21, 1994
Attention: Gordon Shaffer	Sample Number:	BLK072194	Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Butylbenzyl phthalate	600	N.D.
Bis(2-ethylhexyl)phthalate	35	N.D.
Di-n-octyl phthalate	800	N.D.
Di-ethyl phthalate	32,000	N.D.
Di-n-butyl phthalate	4,000	N.D.
Dibenzofuran	0.10	N.D.
Naphthalene	160	N.D.
2-Methylnaphthalene	0.10	N.D.
Pentachlorophenol	4.0	N.D.
Isophorone	500	N.D.
Phenanthrene	0.50	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	81	25-121	Nitrobenzene-d5	65	23-120
Phenol-d6	84	24-113	2-Fluorobiphenyl	68	30-115
2,4,6-Tribromophenol	69	19-122	p-Terphenyl-d14	89	18-137

The results reported above are on a dry weight basis.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG Sunnyside, #00058-019-01
Sample Matrix: Soil
Analysis Method: EPA 8270
Units : mg/kg (ppm)
QC Sample #: 407-0627

Analyst : D. Harmon
Extracted: Jul 20, 1994
Analyzed: Jul 21, 1994
Reported: Aug 2, 1994

MATRIX SPIKE QUALITY CONTROL DATA REPORT

Analyte	Sample Result	Spike Conc. Added	Spike Result	Spike % Recovery	Spike Dup. Result	Spike Duplicate % Recovery	Relative % Difference
Phenol	N.D.	7.7	7.2	94% (36 -137%)	6.7	87% (36 -137%)	7% (60%)
2-Chlorophenol	N.D.	7.7	6.1	79% (39 -114%)	5.9	77% (39 -114%)	3% (59%)
1,4-Dichloro-benzene	N.D.	3.8	2.9	76% (23 -115%)	2.8	74% (23 -115%)	4% (60%)
N-Nitroso-di-n-propylamine	N.D.	3.8	3.4	89% (33 -142%)	3.2	84% (33 -142%)	6% (29%)
1,2,4-Trichloro-benzene	N.D.	3.8	2.5	66% (36 -119%)	2.4	63% (36 -119%)	4% (45%)
4-Chloro-3-methylphenol	N.D.	7.7	6.2	81% (44 -117%)	6.1	79% (44 -117%)	2% (64%)
Acenaphthene	N.D.	3.8	3.2	84% (42 -115%)	3.0	79% (42 -115%)	6% (19%)
4-Nitrophenol	N.D.	7.7	6.6	86% (33 -99%)	6.4	83% (33 -99%)	3% (65%)
2,4-Dinitro-toluene	N.D.	3.8	3.6	95% (20 -124%)	3.4	89% (20 -124%)	6% (27%)
Pentachloro-phenol	N.D.	7.7	6.1	79% (21 -124%)	5.7	74% (21 -124%)	7% (59%)
Pyrene	N.D.	3.8	3.7	97% (46 -142%)	3.4	89% (46 -142%)	8% (14%)

Control Limits in Parentheses

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

% Recovery: $\dfrac{\text{Spike Result - Sample Result}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\dfrac{\text{Spike Result - Spike Dup. Result}}{\text{(Spike Result + Spike Dup. Result) / 2}} \times 100$

Chain-of-Custody Number: A 3[illegible]

SEACOR Chain-of-Custody Record

Address: 11040 Main St. Suite 240
Bellevue, WA 98004
(206) 646-0280 Fax (206) 646-0283

CNG / Sunnyside
512 Decatur E
Sunnyside, WA

Project # 00058-019-01 Task # CO 902
Project Manager Gordon Schaffer
Laboratory NCA
Turn-around time: standard
Sampler's Name: Sonja Fernandez
Sampler's Signature: [signature]

Analysis Request

Sample ID	Date	Time	Matrix	(1) WTPHg/BTEX 8015 (modified)/8020	WTPHd 8015 (modified)	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals				Comments/ Instructions	Number of Containers
MW-9 (4.5)	7/15/94	8:53	S	✓	✓			✓		✓								407062[illegible]7	
MW-9 (10.5-11.0)	7/15/94	9:07	S	✓	✓			✓		✓								628	
MW-10 (4.5-5.0)	7/15/94	11:29	S	✓	✓			✓		✓								629	
MW-10 (9.5-10.0)	7/15/94	11:42	S	✓	✓			✓		✓								630	
MW-11 (5.0-5.5)	7/15/94	14:34	S	✓	✓			✓		✓								631	
MW-11 (10.5-11.0)	7/15/94	14:56	S	✓	✓			✓		✓								632	

Special Instructions/Comments:
(1) WTPH-G only, no BETX
All analyses per quotation
SEA-60894

Relinquished by:
Sign [signature]
Print Sonia Fernandez
Company 58' North Ck. [illegible]
Time 12:00 Date 7/18/94

Received by:
Sign [signature]
Print DANA HEINZ
Company NCA
Time 1320 Date 7/18/94

Relinquished by:
Sign
Print
Company
Time Date

Received by:
Sign
Print
Company
Time Date

Sample Receipt

Total no. of containers
Chain of custody seals:
Rec'd good condition/cold:
Conforms to record:

SEACOR
Client:
Gordon Schaffer
Client Contact:
(206) 646-0280
Client Phone Number:

Date 07 / 15 / 94 Page 1 of 1

NORTH CREEK ANALYTICAL

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01		Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Matrix:	Water		Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	WTPH-G		Analyzed:	Jul 19, 1994
Attention: Gordon Shaffer	First Sample #:	407-0637		Reported:	Aug 2, 1994

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE

Sample Number	Sample Description	Sample Result μg/L (ppb)	Surrogate Recovery %
407-0637	MW-9	75	97
407-0638	MW-10	N.D.	90
407-0639	MW-11	N.D.	86
407-0641	MH-1	N.D.	69
BLK071994	Method Blank	N.D.	96

Reporting Limit:	**50**

4-Bromofluorobenzene surrogate recovery control limits are 50 - 150 %.
Volatile Total Petroleum Hydrocarbons are quantitated as Gasoline Range Organics (toluene - dodecane).
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Shannon Stowell

Matthew T. Essig
for Project Manager

NORTH CREEK ANALYTICAL

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG Sunnyside, #00058-019-01
Sample Matrix: Water
Analysis Method: WTPH-G
Units: μg/L (ppb)

Analyst: R. Lister
F. Shino

Analyzed: Jul 19, 1994
Reported: Aug 2, 1994

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

Gasoline

Spike Conc. Added:	100
Spike Result:	98
% Recovery:	98
Upper Control Limit %:	123
Lower Control Limit %:	77

PRECISION ASSESSMENT
Sample Duplicate

Gasoline Range Organics

Sample Number:	407-0622
Original Result:	8,600
Duplicate Result:	8,400
Relative % Difference	2.4
Maximum RPD:	25

NORTH CREEK ANALYTICAL Inc.

Shannon Strand
for Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result - Duplicate Result}}{\text{(Original Result + Duplicate Result) / 2}} \times 100$

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Matrix:	Water	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	WTPH-D	Extracted:	Jul 18, 1994
Attention: Gordon Shaffer	First Sample #:	407-0637	Analyzed:	Jul 19-20, 1994
			Reported:	Aug 2, 1994

TOTAL PETROLEUM HYDROCARBONS-DIESEL RANGE

Sample Number	Sample Description	Sample Result mg/L (ppm)	Surrogate Recovery %
407-0637	MW-9	5.1 D-1	75
407-0638	MW-10	N.D.	61
407-0639	MW-11	N.D.	83
407-0641	MH-1	0.36	81
BLK071894	Method Blank	N.D.	72

Reporting Limit:	250

2-Fluorobiphenyl surrogate recovery control limits are 50 - 150 %.
Extractable Total Petroleum Hydrocarbons are quantitated as Diesel Range Organics (C12 - C24).
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
for Project Manager

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SEACOR 11040 Main Street, #240 Bellevue, WA 98004 Attention: Gordon Shaffer	Client Project ID: CNG Sunnyside, #00058-019-01 Sample Matrix: Water Analysis Method: WTPH-D Units: mg/L (ppm)	Analyst: D. Anderson Extracted: Jul 18, 1994 Analyzed: Jul 19-20, 1994 Reported: Aug 2, 1994

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT
Laboratory Control Sample

	Diesel
Spike Conc. Added:	2.2
Spike Result:	2.1
% Recovery:	95
Upper Control Limit %:	112
Lower Control Limit %:	83

PRECISION ASSESSMENT
Sample Duplicate

	Diesel Range Organics
Sample Number:	407-0639
Original Result:	N.D.
Duplicate Result:	N.D.
Relative % Difference	Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.
Maximum RPD:	19

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result} - \text{Duplicate Result}}{(\text{Original Result} + \text{Duplicate Result}) / 2} \times 100$

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, MW-1	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8240	Analyzed:	7/19-8/1/1994
Attention: Gordon Shaffer	Sample Number:	407-0633	Reported:	Aug 3, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Acetone	400	N.D.
Benzene	1.0	N.D.
1,1-Dichloroethane	1.0	N.D.
1,2-Dichloroethane	**2.0**	**120**
Ethylbenzene	20	N.D.
Methylene chloride	2.5	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	100	N.D.
Total Xylenes	10	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	110	76-114
Toluene-d8	98	88-110
4-Bromofluorobenzene	89	86-115

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01		Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, MW-2		Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8240		Analyzed:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number:	407-0634		Reported:	Aug 3, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit μg/L (ppb)	Sample Results μg/L (ppb)
Acetone	400	N.D.
Benzene	1.0	N.D.
1,1-Dichloroethane	1.0	N.D.
1,2-Dichloroethane	2.0	N.D.
Ethylbenzene	20	N.D.
Methylene chloride	2.5	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	100	N.D.
Total Xylenes	10	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	113	76-114
Toluene-d8	101	88-110
4-Bromofluorobenzene	93	86-115

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, MW-3	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8240	Analyzed:	7/19-8/1/1994
Attention: Gordon Shaffer	Sample Number:	407-0635	Reported:	Aug 3, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit μg/L (ppb)	Sample Results μg/L (ppb)
Acetone	80,000	N.D.
Benzene	**200**	**2,600**
1,1-Dichloroethane	200	N.D.
1,2-Dichloroethane	**400**	**460**
Ethylbenzene	4,000	N.D.
Methylene chloride	500	N.D.
Toluene	4,000	N.D.
1,1,1-Trichloroethane	20,000	N.D.
Total Xylenes	2,000	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit. Because matrix effects and/or other factors required additional sample dilution, reporting limits for this sample have been raised.

NORTH CREEK ANALYTICAL Inc.

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	116	76-114
Toluene-d8	101	88-110
4-Bromofluorobenzene	92	86-115

Matthew T. Essig
Project Manager

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, MW-4	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8240	Analyzed:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number:	407-0636	Reported:	Aug 3, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Acetone	400	N.D.
Benzene	**1.0**	**110**
1,1-Dichloroethane	1.0	N.D.
1,2-Dichloroethane	**2.0**	**27**
Ethylbenzene	**20**	**59**
Methylene chloride	2.5	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	100	N.D.
Total Xylenes	**10**	**42**

S-3 = The Surrogate Recovery for 1,2-Dichloroethane-d4 is outside of the NCA established control limits.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	132, S-3	76-114
Toluene-d8	100	88-110
4-Bromofluorobenzene	103	86-115

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01		Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, MW-9		Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8240		Analyzed:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number:	407-0637		Reported:	Aug 3, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit μg/L (ppb)	Sample Results μg/L (ppb)
Acetone	400	N.D.
Benzene	1.0	N.D.
1,1-Dichloroethane	1.0	N.D.
1,2-Dichloroethane	**2.0**	**10**
Ethylbenzene	20	N.D.
Methylene chloride	2.5	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	100	N.D.
Total Xylenes	10	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	119	76-114
Toluene-d8	101	88-110
4-Bromofluorobenzene	94	86-115

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, MW-10	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8240	Analyzed:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number:	407-0638	Reported:	Aug 3, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit μg/L (ppb)	Sample Results μg/L (ppb)
Acetone	400	N.D.
Benzene	1.0	N.D.
1,1-Dichloroethane	1.0	N.D.
1,2-Dichloroethane	**2.0**	**3.2**
Ethylbenzene	20	N.D.
Methylene chloride	2.5	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	100	N.D.
Total Xylenes	10	N.D.

S-3 = The Surrogate Recovery for 1,2-Dichloroethane-d4 is outside of the NCA established control limits.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	120, S-3	76-114
Toluene-d8	100	88-110
4-Bromofluorobenzene	91	86-115

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, MW-11	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8240	Analyzed:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number:	407-0639	Reported:	Aug 3, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Acetone	400	N.D.
Benzene	1.0	N.D.
1,1-Dichloroethane	1.0	N.D.
1,2-Dichloroethane	**2.0**	**11**
Ethylbenzene	20	N.D.
Methylene chloride	2.5	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	100	N.D.
Total Xylenes	10	N.D.

S-3 = The Surrogate Recovery for 1,2-Dichloroethane-d4 is outside of the NCA established control limits.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	117, S-3	76-114
Toluene-d8	100	88-110
4-Bromofluorobenzene	91	86-115

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, BLANK	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8240	Analyzed:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number:	407-0640	Reported:	Aug 3, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit μg/L (ppb)	Sample Results μg/L (ppb)
Acetone	400	N.D.
Benzene	1.0	N.D.
1,1-Dichloroethane	1.0	N.D.
1,2-Dichloroethane	2.0	N.D.
Ethylbenzene	20	N.D.
Methylene chloride	2.5	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	100	N.D.
Total Xylenes	10	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	110	76-114
Toluene-d8	100	88-110
4-Bromofluorobenzene	90	86-115

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, MH-1	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8240	Analyzed:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number:	407-0641	Reported:	Aug 1, 1932

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Acetone	400	N.D.
Benzene	1.0	N.D.
1,1-Dichloroethane	1.0	N.D.
1,2-Dichloroethane	2.0	N.D.
Ethylbenzene	20	N.D.
Methylene chloride	2.5	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	100	N.D.
Total Xylenes	10	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	108	76-114
Toluene-d8	98	88-110
4-Bromofluorobenzene	88	86-115

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, MW-12	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8240	Analyzed:	7/19-8/1/1994
Attention: Gordon Shaffer	Sample Number:	407-0642	Reported:	Aug 3, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Acetone	400	N.D.
Benzene	1.0	N.D.
1,1-Dichloroethane	1.0	N.D.
1,2-Dichloroethane	**2.0**	**120**
Ethylbenzene	20	N.D.
Methylene chloride	3.0	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	100	N.D.
Total Xylenes	10	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	106	76-114
Toluene-d8	95	88-110
4-Bromofluorobenzene	87	86-115

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01		
11040 Main Street, #240	Sample Descript:	Method Blank		
Bellevue, WA 98004	Analysis Method:	EPA 8240	Analyzed:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number:	BLK071994	Reported:	Aug 3, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Acetone	400	N.D.
Benzene	1.0	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	2.0	N.D.
Ethylbenzene	20	N.D.
Methylene chloride	2.0	N.D.
Toluene	20	N.D.
1,1,1-Trichloroethane	100	N.D.
Total Xylenes	10	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	103	76-114
Toluene-d8	100	88-110
4-Bromofluorobenzene	92	86-115

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

NORTH CREEK ANALYTICAL

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG Sunnyside, #00058-019-01
Sample Matrix: Water
Analysis Method: EPA 8240
Units: µg/L (ppb)
QC Sample #: 407-0633

Analyst: K. Wilke
Analyzed: Jul 19, 1994
Reported: Aug 3, 1994

MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	1,1-DCE	Benzene	TCE	Toluene	Chloro-benzene
Sample Result:	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10.0	10.0	10.0	10.0	10.0
Spike Result:	5.7	8.8	9.4	11.1	10.1
Spike % Recovery:	57%	88%	94%	111%	101%
Spike Dup. Result:	5.4	8.6	9.1	10.7	9.9
Spike Duplicate % Recovery:	54%	86%	91%	107%	99%
Upper Control Limit %:	120	124	112	120	128
Lower Control Limit %:	56	69	80	75	62
Relative % Difference:	5.4%	2.3%	3.2%	3.7%	2.0%
Maximum RPD:	10	13	11	11	12

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result - Sample Result}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Spike Result - Spike Dup. Result}}{\text{(Spike Result + Spike Dup. Result) / 2}} \times 100$

NORTH CREEK ANALYTICAL

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15055 S.W. Sequoia Parkway, Suite 110 • Portland, OR 97224-7155 (503) 624-9800 • FAX 684-3782

SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, MW-1	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8270	Extracted:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number:	407-0633	Analyzed:	Jul 21, 1994
			Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit μg/L (ppb)	Sample Results μg/L (ppb)
Butylbenzyl phthalate	1,600	N.D.
Bis(2-ethylhexyl)phthalate	3.0	N.D.
Di-n-octyl phthalate	160	N.D.
Di-ethyl phthalate	6,400	N.D.
Di-n-butyl phthalate	800	N.D.
Dibenzofuran	10	N.D.
Isophorone	50	N.D.
2-Methylnaphthalene	10	N.D.
Naphthalene	16	N.D.
Pentachlorophenol	10	N.D.
Phenanthrene	10	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	64	21-100	Nitrobenzene-d5	61	35-114
Phenol-d6	68	10-94	2-Fluorobiphenyl	75	43-116
2,4,6-Tribromophenol	60	10-123	p-Terphenyl-d14	92	33-141

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Shannon Stowell

Matthew T. Essig
Project Manager

NORTH CREEK ANALYTICAL

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01		Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, MW-2		Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8270		Extracted:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number:	407-0634		Analyzed:	Jul 21, 1994
				Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Butylbenzyl phthalate	1,600	N.D.
Bis(2-ethylhexyl)phthalate	3.0	N.D.
Di-n-octyl phthalate	160	N.D.
Di-ethyl phthalate	6,400	N.D.
Di-n-butyl phthalate	800	N.D.
Dibenzofuran	10	N.D.
Isophorone	50	N.D.
2-Methylnaphthalene	10	N.D.
Naphthalene	16	N.D.
Pentachlorophenol	10	N.D.
Phenanthrene	10	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	57	21-100	Nitrobenzene-d5	65	35-114
Phenol-d6	57	10-94	2-Fluorobiphenyl	83	43-116
2,4,6-Tribromophenol	68	10-123	p-Terphenyl-d14	94	33-141

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, MW-3	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8270	Extracted:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number:	407-0635	Analyzed:	Jul 21, 1994
			Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Butylbenzyl phthalate	1,600	N.D.
Bis(2-ethylhexyl)phthalate	3.0	N.D.
Di-n-octyl phthalate	160	N.D.
Di-ethyl phthalate	6,400	N.D.
Di-n-butyl phthalate	800	N.D.
Dibenzofuran	10	N.D.
Isophorone	50	N.D.
2-Methylnaphthalene	**10**	**27**
Naphthalene	**16**	**120**
Pentachlorophenol	10	N.D.
Phenanthrene	10	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	85	21-100	Nitrobenzene-d5	77	35-114
Phenol-d6	98, S-3	10-94	2-Fluorobiphenyl	66	43-116
2,4,6-Tribromophenol	75	10-123	p-Terphenyl-d14	95	33-141

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

Please Note:
S-3 = The Surrogate Recovery for Phenol-d6 is outside of NCA established control limits.

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, MW-4	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8270	Extracted:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number:	407-0636	Analyzed:	Jul 21, 1994
			Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Butylbenzyl phthalate	1,600	N.D.
Bis(2-ethylhexyl)phthalate	3.0	N.D.
Di-n-octyl phthalate	160	N.D.
Di-ethyl phthalate	6,400	N.D.
Di-n-butyl phthalate	800	N.D.
Dibenzofuran	10	N.D.
Isophorone	50	N.D.
2-Methylnaphthalene	10	N.D.
Naphthalene	16	N.D.
Pentachlorophenol	10	N.D.
Phenanthrene	10	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	95	21-100	Nitrobenzene-d5	69	35-114
Phenol-d6	87	10-94	2-Fluorobiphenyl	78	43-116
2,4,6-Tribromophenol	67	10-123	p-Terphenyl-d14	97	33-141

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

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SEACOR	Client Project ID: CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript: Water, MW-12	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method: EPA 8270	Extracted:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number: 407-0642	Analyzed:	Jul 21, 1994
		Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit μg/L (ppb)	Sample Results μg/L (ppb)
Butylbenzyl phthalate	1,600	N.D.
Bis(2-ethylhexyl)phthalate	6.0	N.D.
Di-n-octyl phthalate	160	N.D.
Di-ethyl phthalate	6,400	N.D.
Di-n-butyl phthalate	800	N.D.
Dibenzofuran	10	N.D.
Isophorone	50	N.D.
2-Methylnaphthalene	10	N.D.
Naphthalene	16	N.D.
Pentachlorophenol	10	N.D.
Phenanthrene	10	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	27	21-100	Nitrobenzene-d5	55	35-114
Phenol-d6	38	10-94	2-Fluorobiphenyl	66	43-116
2,4,6-Tribromophenol	39	10-123	p-Terphenyl-d14	86	33-141

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG Sunnyside, #00058-019-01
Sample Descript: Method Blank
Analysis Method: EPA 8270
Sample Number: BLK071994

Extracted: Jul 19, 1994
Analyzed: Jul 21, 1994
Reported: Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Butylbenzyl phthalate	1,600	N.D.
Bis(2-ethylhexyl)phthalate	3.0	N.D.
Di-n-octyl phthalate	160	N.D.
Di-ethyl phthalate	6,400	N.D.
Di-n-butyl phthalate	800	N.D.
Dibenzofuran	10	N.D.
Isophorone	50	N.D.
2-Methylnaphthalene	10	N.D.
Naphthalene	16	N.D.
Pentachlorophenol	10	N.D.
Phenanthrene	10	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	81	21-100	Nitrobenzene-d5	65	35-114
Phenol-d6	84	10-94	2-Fluorobiphenyl	68	43-116
2,4,6-Tribromophenol	69	10-123	p-Terphenyl-d14	89	33-141

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG Sunnyside, #00058-019-01
Sample Matrix: Water
Analysis Method: EPA 8270
Units : $\mu g/L$ (ppb)
QC Sample #: 407-0642

Analyst : D. Harmon
Extracted: Jul 19, 1994
Analyzed: Jul 22, 1994
Reported: Aug 2, 1994

MATRIX SPIKE QUALITY CONTROL DATA REPORT

Analyte	Sample Result	Spike Conc. Added	Spike Result	Spike % Recovery	Spike Dup. Result	Spike Duplicate % Recovery	Relative % Difference
Phenol	N.D.	200	122	61% (39 -122%)	117	59% (39 -122%)	4% (38%)
2-Chlorophenol	N.D.	200	148	74% (42 -137%)	137	69% (42 -137%)	8% (60%)
1,4-Dichloro-benzene	N.D.	100	49	49% (37 -122%)	47	47% (37 -122%)	4% (41%)
N-Nitroso-di-n-propylamine	N.D.	100	80	80% (47 -154%)	74	74% (47 -154%)	8% (46%)
1,2,4-Trichloro-benzene	N.D.	100	65	65% (34 -136%)	65	65% (34 -136%)	0% (44%)
4-Chloro-3-methylphenol	N.D.	200	176	88% (42 -136%)	150	75% (42 -136%)	16% (43%)
Acenaphthene	N.D.	100	61	61% (32 -140%)	56	56% (32 -140%)	9% (45%)
4-Nitrophenol	N.D.	200	165	83% (0 -99%)	154	77% (0 -99%)	7% (69%)
2,4-Dinitro-toluene	N.D.	100	92	92% (46 -146%)	86	86% (46 -146%)	7% (47%)
Pentachloro-phenol	N.D.	200	146	73% (40 -180%)	137	69% (40 -180%)	6% (40%)
Pyrene	N.D.	100	94	94% (52 -166%)	87	87% (52 -166%)	8% (46%)

Control Limits in Parentheses

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result - Sample Result}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Spike Result - Spike Dup. Result}}{\text{(Spike Result + Spike Dup. Result) / 2}} \times 100$

Chain-of-Custody Number: A 247

SEACOR Chain-of-Custody Record

Address:
11040 Main St. Suite 240
Bellevue, WA 98004
(206) 646-0280 FAX: (206) 646-0283

CNG / Sunnyside
512 Decatur E
Sunnyside, WA

Project # 00058-019-01 Task # C0902
Project Manager Gordon Schaffer
Laboratory NCA
Turn-around time: standard

Sampler's Name: Sonia Fernandez
Sampler's Signature: [signature]

Analysis Request

Sample ID	Date	Time	Matrix	① WTPHg/BTEX 8015 (modified)/8020	WTPHd 8015 (modified)	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics • 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals				Comments/Instructions	Number of Containers
MW-1	7/16/94	11:00	W					✓		✓								4070633	6
MW-2	7/16/94	10:00	W					✓		✓								634	6
MW-3	7/16/94	15:55	W					✓		✓								635	6
MW-4	7/16/94	15:05	W					✓		✓								636	6
MW-9	7/16/94	12:05	W	✓	✓			✓		✓								637	6
MW-10	7/16/94	13:15	W	✓	✓			✓		✓								638	6
MW-11	7/16/94	14:15	W	✓	✓			✓		✓								639	6
Blank			W					✓		✓								640	1
MH-1	7/16/94	9:00	W	✓	✓			✓		✓								641	6
MW-12	7/16/94	11:30	W					✓		✓								642	6

Special Instructions/Comments:
① WTPH-G ONLY NO BTEX
All ANALYSES PER QUOTATION #
SEA-60894

Relinquished by:
Sign [signature]
Print Sonia Fernandez
Company North Ck Anal.
Time 12:00 Date 7/18/94

Received by:
Sign [signature]
Print DANA HEINZ
Company NCA
Time 1320 Date 7/18/94

Relinquished by:
Sign
Print
Company
Time Date

Received by:
Sign
Print
Company
Time Date

Sample Receipt
Total no. of containers:
Chain of custody seals:
Rec'd good condition/cold:
Conforms to record:

SEACOR
Client:
Gordon Schaffer
Client Contact:
(206) 646-0280
Client Phone Number:

Date 07/14/94 Page 1 of 1

AUGUST 1994
RI/FS SAMPLING

NORTH CREEK ANALYTICAL

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9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

SEACOR 11040 Main Street, #240 Bellevue, WA 98004 Attention: Gordon Shaffer	Client Project ID: CNG Sunnyside, #00058-019-01 Sample Descript: Water, CD-WEST Analysis Method: EPA 8240 Sample Number: 408-0322	Sampled: Aug 5, 1994 Received: Aug 8, 1994 Analyzed: Aug 10, 1994 Reported: Aug 16, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit μg/L (ppb)	Sample Results μg/L (ppb)
Acetone	10	N.D.
Benzene	2.0	30
1,1-Dichloroethane	2.0	N.D.
1,2-Dichloroethane	2.0	N.D.
Ethylbenzene	5.0	18
Methylene chloride	5.0	N.D.
Toluene	2.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
Total Xylenes	5.0	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	106	76-114
Toluene-d8	100	88-110
4-Bromofluorobenzene	97	86-115

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SEACOR	Client Project ID: CNG Sunnyside, #00058-019-01	Sampled:	Aug 5, 1994
11040 Main Street, #240	Sample Descript: Water, CD-EAST	Received:	Aug 8, 1994
Bellevue, WA 98004	Analysis Method: EPA 8240	Analyzed:	Aug 10, 1994
Attention: Gordon Shaffer	Sample Number: 408-0323	Reported:	Aug 16, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit μg/L (ppb)	Sample Results μg/L (ppb)
Acetone	10	N.D.
Benzene	2.0	N.D.
1,1-Dichloroethane	2.0	N.D.
1,2-Dichloroethane	2.0	N.D.
Ethylbenzene	5.0	N.D.
Methylene chloride	5.0	N.D.
Toluene	2.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
Total Xylenes	5.0	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	106	76-114
Toluene-d8	101	88-110
4-Bromofluorobenzene	95	86-115

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01			
11040 Main Street, #240	Sample Descript:	Method Blank			
Bellevue, WA 98004	Analysis Method:	EPA 8240		Analyzed:	Aug 10, 1994
Attention: Gordon Shaffer	Sample Number:	BLK081094		Reported:	Aug 16, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit μg/L (ppb)	Sample Results μg/L (ppb)
Acetone	10	N.D.
Benzene	2.0	N.D.
1,1-Dichloroethane	2.0	N.D.
1,2-Dichloroethane	2.0	N.D.
Ethylbenzene	5.0	N.D.
Methylene chloride	5.0	N.D.
Toluene	2.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
Total Xylenes	5.0	N.D.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	105	76-114
Toluene-d8	100	88-110
4-Bromofluorobenzene	94	86-115

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SEACOR
11040 Main Street, #240
Bellevue, WA 98004
Attention: Gordon Shaffer

Client Project ID: CNG Sunnyside, #00058-019-01
Sample Matrix: Water
Analysis Method: EPA 8240
Units: μg/L (ppb)
QC Sample #: 408-0196

Analyst: K. Wilke

Analyzed: Aug 10, 1994
Reported: Aug 16, 1994

MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	1,1-DCE	Benzene	TCE	Toluene	Chloro-benzene
Sample Result:	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10.0	10.0	10.0	10.0	10.0
Spike Result:	10.6	10.6	9.2	10.4	9.8
Spike % Recovery:	106%	106%	92%	104%	98%
Spike Dup. Result:	10.8	10.6	9.5	10.4	10.0
Spike Duplicate % Recovery:	108%	106%	95%	104%	100%
Upper Control Limit %:	120	124	112	120	128
Lower Control Limit %:	56	69	80	75	62
Relative % Difference:	1.9%	0.0%	3.2%	0.0%	2.0%
Maximum RPD:	10	13	11	11	12

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

% Recovery: $\frac{\text{Spike Result - Sample Result}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Spike Result - Spike Dup. Result}}{\text{(Spike Result + Spike Dup. Result) / 2}} \times 100$

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9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

SEACOR	Client Project ID: CNG Sunnyside, #00058-019-01	Sampled:	Aug 5, 1994
11040 Main Street, #240	Sample Descript: Water, MW-3	Received:	Aug 8, 1994
Bellevue, WA 98004	Analysis Method: EPA 8240	Analyzed:	Aug 10, 1994
Attention: Gordon Shaffer	Sample Number: 408-0324	Reported:	Aug 16, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Acetone	10	51
Benzene	2.0	2,300
1,1-Dichloroethane	2.0	N.D.
1,2-Dichloroethane	2.0	400
Ethylbenzene	5.0	330
Methylene chloride	5.0	N.D.
Toluene	2.0	220
1,1,1-Trichloroethane	5.0	N.D.
Total Xylenes	5.0	220

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	103	76-114
Toluene-d8	100	88-110
4-Bromofluorobenzene	103	86-115

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East 11115 Montgomery, Suite B • Spokane, WA 99206-4776 (509) 924-9200 • FAX 924-9290
9405 S.W. Nimbus Avenue • Beaverton, OR 97008-7132 (503) 643-9200 • FAX 644-2202

SEACOR	Client Project ID: CNG Sunnyside, #00058-019-01	Sampled:	Aug 5, 1994
11040 Main Street, #240	Sample Descript: Water, TRIP BLANK	Received:	Aug 8, 1994
Bellevue, WA 98004	Analysis Method: EPA 8240	Analyzed:	Aug 10, 1994
Attention: Gordon Shaffer	Sample Number: 408-0325	Reported:	Aug 16, 1994

VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Acetone	10	N.D.
Benzene	2.0	N.D.
1,1-Dichloroethane	2.0	N.D.
1,2-Dichloroethane	2.0	N.D.
Ethylbenzene	5.0	N.D.
Methylene chloride	5.0	N.D.
Toluene	2.0	N.D.
1,1,1-Trichloroethane	5.0	N.D.
Total Xylenes	5.0	N.D.

S-3 = The Surrogate Recovery for 1,2-Dichloroethane-d4 is outside of the NCA established control limits.

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig

Matthew T. Essig
Project Manager

Surrogate Standards Percent Recovery:		Control Limits
1,2-Dichloroethane-d4	117, S-3	76-114
Toluene-d8	102	88-110
4-Bromofluorobenzene	98	86-115

Chain-of-Custody Number: A 4459

SEACOR Chain-of-Custody Record

Address: 11040 Main St. Ste. 240
Bellevue, WA. 98004
206-646-0280 Fax: 206-646-0283

Cascade Natural Gas Corporation
512 East Decatur Ave.
Sunnyside, WA.

Project # 00058-019-01 Task # C0902
Project Manager Gordon Shaffer
Laboratory NCA
Turn-around time: 5 days
Sampler's Name: ~~Steve~~ Steve Wiebe
Sampler's Signature: Steve Wiebe

Analysis Request

Sample ID	Date	Time	Matrix	TPHg/BTEX 8015 (modified)/8020	TPHd 8015 (modified)	TPH 418.1	Aromatic Volatiles 602/8020	Volatile Organics 624/8240 (GC/MS)	Halogenated Volatiles 601/8010	Semi-volatile Organics 625/8270 (GC/MS)	Pesticides/PCB's 608/8080	Total Lead 7421	Priority Pollutant Metals (13)	TCLP Metals				Comments/ Instructions	Number of Containers
CD-WEST 4080322	8-5-94	1130	water					X										Washington methods	2
CD-EAST 0323	↓	1145	↓					X										please	3
MW-3 0324	↓	1315	↓					X											3
Trip blank 0325			↓					X											1

Special Instructions/Comments:
All analysis per quotation
SEA-60894

Relinquished by:
Sign Steve Wiebe
Print Steve Wiebe
Company SEACOR
Time 1200 Date 8-8-94

Received by:
Sign Dana Heinz
Print DANA HEINZ
Company NCA
Time 1230pm Date 8/8/94

Sample Receipt
Total no. of containers
Chain of custody seals:
Rec'd good condition/cold:
Conforms to record:

Relinquished by:
Sign
Print
Company
Time Date

Received by:
Sign
Print
Company
Time Date

Client: Cascade Natural Gas Corp
Client Contact: Louis Langwell
Client Phone Number: 509-837-2041

Date 8 / 8 / 94 Page 1 of 1

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15055 S.W. Sequoia Parkway, Suite 110 • Portland, OR 97224-7155 (503) 624-9800 • FAX 684-3782

SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, MW-9	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8270	Extracted:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number:	407-0637	Analyzed:	Jul 21, 1994
			Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Butylbenzyl phthalate	1,600	N.D.
Bis(2-ethylhexyl)phthalate	3.0	N.D.
Di-n-octyl phthalate	160	N.D.
Di-ethyl phthalate	6,400	N.D.
Di-n-butyl phthalate	800	N.D.
Dibenzofuran	10	N.D.
Isophorone	50	N.D.
2-Methylnaphthalene	10	N.D.
Naphthalene	16	N.D.
Pentachlorophenol	10	N.D.
Phenanthrene	10	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	92	21-100	Nitrobenzene-d5	75	35-114
Phenol-d6	98, S-3	10-94	2-Fluorobiphenyl	86	43-116
2,4,6-Tribromophenol	67	10-123	p-Terphenyl-d14	95	33-141

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

Please Note:
S-3 = The Surrogate Recovery for Phenol-d6 is outside of NCA established control limits.

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SEACOR	Client Project ID: CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript: Water, MW-10	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method: EPA 8270	Extracted:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number: 407-0638	Analyzed:	Jul 22, 1994
		Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Butylbenzyl phthalate	1,600	N.D.
Bis(2-ethylhexyl)phthalate	6.0	N.D.
Di-n-octyl phthalate	160	N.D.
Di-ethyl phthalate	6,400	N.D.
Di-n-butyl phthalate	800	N.D.
Dibenzofuran	10	N.D.
Isophorone	50	N.D.
2-Methylnaphthalene	10	N.D.
Naphthalene	16	N.D.
Pentachlorophenol	10	N.D.
Phenanthrene	10	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	70	21-100	Nitrobenzene-d5	87	35-114
Phenol-d6	76	10-94	2-Fluorobiphenyl	92	43-116
2,4,6-Tribromophenol	61	10-123	p-Terphenyl-d14	98	33-141

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

~~Matthew T. Essig~~
~~Project Manager~~

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SEACOR	Client Project ID:	CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript:	Water, MW-11	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method:	EPA 8270	Extracted:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number:	407-0639	Analyzed:	Jul 21, 1994
			Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit μg/L (ppb)	Sample Results μg/L (ppb)
Butylbenzyl phthalate	1,600	N.D.
Bis(2-ethylhexyl)phthalate	10	N.D.
Di-n-octyl phthalate	160	N.D.
Di-ethyl phthalate	6,400	N.D.
Di-n-butyl phthalate	800	N.D.
Dibenzofuran	10	N.D.
Isophorone	50	N.D.
2-Methylnaphthalene	10	N.D.
Naphthalene	16	N.D.
Pentachlorophenol	10	N.D.
Phenanthrene	10	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	22	21-100	Nitrobenzene-d5	21, S-3	35-114
Phenol-d6	21	10-94	2-Fluorobiphenyl	13, S-3	43-116
2,4,6-Tribromophenol	22	10-123	p-Terphenyl-d14	22, S-3	33-141

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager

Please Note:
S-3 The Surrogate Recoveries for Nitrobenzene-d5, 2-Fluorobiphenyl and p-Terphenyl-d-14 are outside of the NCA established control limits.
A portion of the sample extract was lost during concentration causing low recoveries of the surrogates. The net effect of low recovery is to cause the reporting limit to be five times higher than normal.

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SEACOR	Client Project ID: CNG Sunnyside, #00058-019-01	Sampled:	Jul 16, 1994
11040 Main Street, #240	Sample Descript: Water, MH-1	Received:	Jul 18, 1994
Bellevue, WA 98004	Analysis Method: EPA 8270	Extracted:	Jul 19, 1994
Attention: Gordon Shaffer	Sample Number: 407-0641	Analyzed:	Jul 26, 1994
		Reported:	Aug 2, 1994

SEMI-VOLATILE ORGANICS by GC/MS

Analyte	Reporting Limit µg/L (ppb)	Sample Results µg/L (ppb)
Butylbenzyl phthalate	1,600	N.D.
Bis(2-ethylhexyl)phthalate	3.0	N.D.
Di-n-octyl phthalate	160	N.D.
Di-ethyl phthalate	6,400	N.D.
Di-n-butyl phthalate	800	N.D.
Dibenzofuran	10	N.D.
Isophorone	50	N.D.
2-Methylnaphthalene	10	N.D.
Naphthalene	16	N.D.
Pentachlorophenol	10	N.D.
Phenanthrene	10	N.D.

Surrogate Standards Percent Recovery:		Control Limits	Surrogate Standards Percent Recovery:		Control Limits
2-Fluorophenol	84	21-100	Nitrobenzene-d5	87	35-114
Phenol-d6	92	10-94	2-Fluorobiphenyl	81	43-116
2,4,6-Tribromophenol	66	10-123	p-Terphenyl-d14	87	33-141

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Matthew T. Essig
Project Manager