L10.09

0 0020

Environmental Site Assessment
303 West Fireweed Lane
Anchorage, Alaska

September, 1992

Chevron U.S.A. Products Company
P.O.Box 5004
2410 Camino Ramon
San Ramon, CA 94583-0804

SHANNON & WILSON, INC.
5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ENVIRONMENTAL SITE ASSESSMENT
303 WEST FIREWEED LANE
ANCHORAGE, ALASKA

1.0 INTRODUCTION

This report presents the results of our environmental site assessment at Chevron Station Number 9-6097, at 303 West Fireweed Lane, Anchorage, Alaska. Shannon & Wilson was retained to develop a professional opinion as to the presence of petroleum hydrocarbon constituents in the site's subsurface soils and groundwater due to the past and present operation of a filling station. This report summarizes the status of the project, describes our sampling activities, presents the results of field headspace screening and laboratory analyses, and characterizes the subsurface conditions and extent of impact to soils and groundwater from petroleum hydrocarbons.

This work was performed in accordance with our revised cost proposal of August 6, 1992. Written authorization to proceed with this project was received on August 6, 1992, from Mr. Phil Briggs of Chevron, USA Inc.

2.0 SITE AND PROJECT DESCRIPTION

The subject site is located at 303 West Fireweed Lane, Anchorage, Alaska. The site is located in a commercial area about 1 mile south of downtown Anchorage. The legal description is Section 19, Township 13 North, Range 3 West, Anchorage (A-8) SW Quadrangle, Seward Meridian. The site is relatively flat but the entire area dips gently toward the northeast. The general features at the project site are shown in Figure 1.

This Chevron Station operates as a full service filling station 303 West Fireweed Lane. Two 10,000 gallon USTs containing unleaded and leaded regular gasoline and 1-5,000 unleaded supreme gasoline are located near the northeast side of the current building. In addition, a waste oil UST is present at the southwest outside corner of the building and a heating oil UST is present on the northwest outside wall of the building. The bottom of the UST array is estimated to be at about 11.0 feet below the surface according to the operator of the station.

Shannon & Wilson was retained to sample seven soil borings and install and sample five monitoring wells. The borings and monitoring wells were constructed by Discovery Drilling of

Anchorage under subcontract to Shannon & Wilson. Shannon & Wilson was responsible for performing subsurface soil and groundwater sampling, screening the surface and subsurface soil samples in the exploratory borings and monitoring wells, coordinating with the analytical laboratory for testing of the soil and water samples, and reporting the results of these efforts to Mr. Phil Briggs of Chevron USA. Superior Precision Analytical, Inc., was contracted directly by Chevron to perform the soil and groundwater analyses.

3.0 FIELD EXPLORATIONS

Field investigations performed for this UST site assessment project included drilling seven exploratory borings, installing five groundwater monitoring wells and collecting soil and water samples for laboratory analyses. These work items are discussed below.

3.1 Exploratory Borings

Seven soil borings, five with monitoring wells were installed at locations B1,B2, and MW1 through MW5 shown on Figure 1. The borings with monitoring wells were positioned to avoid the locations of buried underground utilities and overhead utilities as well as to assess potential releases from on-site sources of petroleum hydrocarbons. The borings were drilled to depths ranging from 31.5 to 53.5 feet with a truck-mounted CME-75 drill rig by Discovery Drilling of Anchorage. The test holes were advanced using a 4-inch inside diameter (I.D.) hollow stem auger. Borings MW1 to MW5 were redrilled with 6-inch diameter (I.D.) hollow stem auger with a wooden plug inserted into the bottom of the auger such that the borings could be completed as 4-inch diameter monitoring wells. The boring logs are presented in Figures 2 through 8.

A representative from Shannon & Wilson was present continuously during drilling to locate the borings, log the materials encountered in the test holes, screen surface and subsurface soils, and to record detailed information on the borings, monitoring well installations, and site activities. All drilling equipment was steam cleaned prior to use on each succeeding hole to avoid potential cross-contamination of soil by residue from previous borings. The drill cuttings removed from the borings were placed in heavy duty woven plastic storage "super sacks" stored at the northwest side of the site as shown in Figure 1.

3.2 Sampling and Screening

In the seven borings, soil samples were recovered at 5.0 foot intervals using modified penetration resistance test methods from the surface to a depth of 53.5 feet. Soil samples were obtained by driving a three-inch outside diameter (O.D.) split spoon sampler into the bottom of the boring with blows of a 340 pound hammer free falling onto the rods.

Prior to sampling, the split spoon samplers were scrubbed with a dilute Alconox wash solution, followed by a sequence of tap water, methanol and deionized water rinses. Analytical samples were collected by quickly and completely filling laboratory provided 8 oz. glass jars with teflon-lined lids. The sample jars were further sealed with teflon tape at the lid-jar contact. All samples were transferred from the sampler to the jars using a decontaminated stainless steel spoon. The number, depth and description of the samples recovered from the borings are summarized in Table 1.

The split spoon samples obtained from each of the borings were screened for volatile organic compounds using an OVM 580B photoionization detector (PID) calibrated with an isobutylene standard gas and mathematically correlated to equivalent benzene concentration. The PID was used to sample the volatile gases released by the soil sample using headspace sampling methods. The headspace samples were collected after the analytical samples by quickly filling 8 oz. glass jars with freshly exposed soils to within one half of the jar's volume, again using a decontaminated stainless steel spoon. The jar was then sealed with a metal lid with a rubber seal. The headspace samples were allowed to equilibrate to a common temperature before screening with the PID in a still environment. Screening was accomplished by inserting the sampling probe through a punctured hole in the lid, into the jar. The PID display was observed and the maximum reading was recorded for each sample. The results of the headspace screening are presented on the boring logs and are summarized in Table 2.

3.3 Monitoring Well Installation

Five monitoring wells, designated MW1 through MW5, were placed in Borings MW1 through MW5, respectively, during this site assessment. A ten foot section of four-inch I.D. schedule 40, PVC well screen, with 0.020-inch machine-cut slots were used to construct the monitoring wells. Additional solid sections of PVC pipe were added to the well screen as

appropriate to extend the monitoring well casings to slightly below the ground surface. Threaded couplings, requiring no glue, were used in the construction of the monitoring well casing. Silica sand was used to backfill around the well screen from 2 to 3 feet above the well screen. Bentonite chips and/or Volclay grout seals were then placed above the sand backfill. Flush mounted aluminum monitoring well casings were installed to protect the PVC pipe in each boring and locked. Pea gravel cement grout was placed around each casing. The monitoring well construction details are presented on the boring logs.

3.4 Monitoring Well Sampling

Water samples from the five monitoring wells placed during the site assessment were recovered on August 27 through August 29, 1992. Before sampling of the wells, a water level measurement was obtained using an electrical water level indicator device, measuring down from a marked location on the rim of the PVC pipe. Next, sampling was initiated by developing and purging the well using a Brainard-Kilman hand pump or an American Sigma air lift pump system. Approximately 8 to 10 well volumes were purged from the wells prior to sampling. The water produced from the well installations was stored on-site in 55 gallon barrels. These barrels are located with the drill cuttings in the northwest corner of the site. The sample locations and descriptions are summarized in Table 1.

After developing and purging was completed, a disposable Voss bailer was used to retrieve a water sample. A water sample was obtained after determining that the well had recovered at least 80% of its volume. The sample was placed in laboratory supplied bottles and then in a chilled cooler for delivery to the laboratory. Temperature, conductivity, and pH measurements (T-C-pH) were conducted in the field at the time of sampling. The results of the developing, purging, water level, pH, conductivity, and temperature measurements for each of the monitoring wells are presented on the Water Sampling Log in Table 3.

The horizontal positions of the monitoring wells were located by a Shannon & Wilson engineer taping from permanent on-site structures. The vertical elevations of the monitoring wells were determined using a rod and level in a closed loop vertical survey to an accuracy of 0.01 feet. An arbitrary vertical elevation of 100.00 feet was assigned to the temporary bench mark (TBM), located at the top surface of the concrete floor pad exposed immediately outside of the northeast corner of the service station building. The monitoring well measuring point elevations, are

referenced to this TBM and are summarized in Table 3. The groundwater elevation is also referenced to this TBM.

4.0 LABORATORY ANALYSES

For this project, twenty-one (21) soil samples were selected for analysis to characterize the in-place soils for potential impact by petroleum hydrocarbon constituents. These samples were analyzed for total petroleum hydrocarbons, TPH, by EPA Method 418.1, gasoline range organics, GRO, by EPA Method 5030/8015, diesel range organics, DRO, by EPA Method 3550/8100, and aromatic volatile organics, BTEX by EPA Method 8020.

Water samples obtained from the five monitoring wells were analyzed for TPH by EPA Method 418.1, GRO by EPA Method 5030/8015, and BTEX by EPA Method 602. A duplicate water sample, Sample MW2W1DUP, taken from Monitoring Well MW2, was submitted and analyzed for BTEX (EPA 8020) for quality control purposes. The description and locations for the water samples are presented in Table 1.

At the completion of the soil and water sampling activities Shannon and Wilson's representative sent the selected soil samples to the laboratory under Chain-of-Custody procedures. All laboratory analyses were performed by Superior Precision Analytical, Inc., of Martinez, California. The results of the soil sample analysis and water sample analysis are summarized in Table 2 . The individual laboratory reports are presented in Appendix A.

5.0 SUBSURFACE CONDITIONS

5.1 Soils

The subsurface materials encountered in the borings at 303 West Fireweed Lane consist mainly of granular soils, including sand and gravel with local coal fragments and lenses present at varied stratigraphic levels. Finer-grained sand, silty sand, and silt layers were interbedded with the coarser-grained sand layers present below 25 feet in most borings. A color change from brown/gray-brown to gray at a depth of 45 to 50 feet was observed and appeared to be coincident with the initial occurrence of groundwater. The ground surface was covered by about 0.25 feet of relatively unweathered asphalt pavement. The subsurface materials encountered in the borings at the subject site are depicted in Figure 10.

Soil samples collected from Borings B1 and B2 were composited into two samples, one composite sample from each boring, and designated B1 and B2. The composite soil samples were analyzed in Shannon & Wilson's Anchorage laboratory for grain size distribution. The grain size distribution curves for both samples are presented in Figure 9. Based on the grain size distribution, both samples are well-sorted, silty, gravelly sands containing a range of 12-14 percent fines passing the No. 200 U.S. Standard sieve.

5.2 Groundwater

Five monitoring wells were installed at the 303 West Fireweed Lane site to facilitate sampling of groundwater for analytical testing, to monitor the depth of groundwater and to confirm the gradient and direction of groundwater flow. The static groundwater levels were measured in the monitoring wells at depths of about 46 to 48 feet below the surface. Static water level readings measured on September 8, 1992, were used in the water level (potentiometric surface) contour map shown on Figure 1. The gradient of the potentiometric surface is approximately 2.6% and the general groundwater flow directions is toward the northwest.

6.0 DISCUSSION OF ANALYTICAL RESULTS

The analytical testing program for this project was designed to reflect the products present in the site's UST array and pump islands which included leaded and unleaded gasoline, waste oil, and heating oil. Therefore, the soil samples collected were analyzed for gasoline range organics (GRO), diesel range organics (DRO), total petroleum hydrocarbons (TPH), and aromatic volatile organics (BTEX). The residual range petroleum hydrocarbon concentration (RPH), which equals the TPH-GRO-DRO concentrations, has also been calculated. The groundwater samples were analyzed for BTEX, TPH, and GRO. The results from each of the samples analyzed are compared to the allowable levels of petroleum hydrocarbons in soil and water based on the ADEC Matrix Score Sheet presented in Table 4 and ADEC guidance manuals. Based on site conditions the most stringent ADEC cleanup levels, Level A, apply to this site.

6.1 Soils

Borings B1 and B2 were drilled at the location of the proposed new UST array. Three soil samples collected from Boring B-1, Samples B1S2, B1S5, and B1S7 were taken from depths of

5.0-6.5, 15.0-16.5, and 30.0-31.5 feet, respectively. Sample B1S5 was non-detectable for GRO, BTEX, DRO, TPH, and RPH. Sample B1S2 had detectable levels of TPH, GRO, DRO, RPH, and xylenes reported at concentrations of 570 ppm, 6 ppm, 560 ppm, 4 ppm, and 0.6 ppm, respectively. Sample B1S7 had 13 ppm GRO and 2.19 ppm total BTEX, with 0.25 ppm toluene, 0.24 ppm ethylbenzene, and 1.7 ppm xylenes.

Three soil samples collected from Boring B-2, Samples B2S1, B2S3, and B2S6, were taken from depths of 5.0-6.5, 15.0-16.5, and 30.0-31.5 feet, respectively, and contained detectable concentrations of GRO, BTEX, DRO, and TPH. Sample B2S1 had 85 ppm TPH and 0.09 ppm xylenes. Sample B2S3 had 3 ppm GRO and 0.16 ppm xylenes. Other parameters for these two samples were reported as non-detectable. Sample B2S6 had 62 ppm TPH, 1800 ppm GRO, 26 ppm DRO, and 91.3 ppm total BTEX with 2.1 ppm benzene, 5.2 ppm toluene, 13 ppm ethylbenzene, and 71 ppm xylenes. Note that the laboratory reported the DRO detected from sample B2S6 had a nontypical diesel pattern observed on the chromatograms. This could be a result of the fuel being weathered or possibly that the hydrocarbon present is a fuel oil. Borings B1 and B2 were located in the general vicinity of the proposed new UST array. Based on the results of the analytical testing, the soil in these areas appear to be impacted by petroleum hydrocarbons and exceed the allowable levels for DRO (100 ppm), GRO (50 ppm), total BTEX (10 ppm), and benzene (0.1 ppm) in the near subsurface.

Boring MW1 is located at the northeast corner of the current UST array. Three soil samples collected from Boring MW1, Samples MW1S2, MW1S6, and MW1S9, were taken from depths of 10.0-11.5, 30.0-31.5, and 45.0-46.5 feet, respectively. TPH and DRO were detected in sample MW1S2 at concentrations of 300 and 25 ppm, respectively. RPH is calculated to be 275 ppm. Sample MW1S6 had 77 ppm GRO, 17 ppm DRO, and 10.49 ppm total BTEX with 0.22 ppm benzene, 1.6 ppm toluene, 0.97 ppm ethylbenzene, and 7.7 ppm xylenes. Sample MW1S9 had detectable concentrations of GRO and xylenes of 3 and 0.16 ppm, respectively. Note that the laboratory reported the DRO detected from two samples from Boring MW1 had a nontypical diesel pattern observed on the chromatograms. The report indicated that MW1S2 had hydrocarbons heavier than #2 diesel and that MW1S6 had hydrocarbons lighter than diesel. This could be a result of the fuel being weathered or possibly that the hydrocarbon present is a fuel oil. Based on the results of the analytical testing, the soil in this area appears to be impacted by petroleum hydrocarbons that exceed the allowable levels for GRO (50 pm), benzene (0.1 ppm) and total BTEX (10 ppm).

Three soil samples collected from Boring MW2, Samples MW2S2, MW2S7, and MW2S11, were taken from depths of 9.0-10.5, 34.0-35.5, and 52.5-53.5 feet, respectively. TPH and xylenes were detected in sample MW2S2 at concentrations of 17 and 0.006 ppm, respectively. RPH is calculated to be 17 ppm. Sample MW2S7 had 150 ppm TPH, 1100 ppm GRO, and 242.84 ppm total BTEX with 0.84 ppm benzene, 42 ppm toluene, 30 ppm ethylbenzene, and 170 ppm xylenes. Sample MW2S11 had detectable concentrations of 0.146 ppm total BTEX with 0.012 ppm benzene, 0.046 ppm toluene, 0.013 ppm ethylbenzene, and 0.075 ppm xylenes. Boring MW2 is located at the southeast corner of the current UST array and northwest of the eastern most pump island. Based on the results of the analytical testing, the soil in this area appears to be impacted by petroleum hydrocarbons that exceed the most stringent ADEC levels for GRO (50 pm), benzene (0.1 ppm) and total BTEX (10 ppm).

Boring MW3 is located to the southwest of the first pump island east of the service station building. Three soil samples collected from Boring MW3, Samples MW3S2, MW3S6, and MW3S11, were taken from depths of 9.0-10.5, 29.0-30.5, and 52.5-53.5 feet, respectively. Detected in sample MW3S2 were 330 ppm TPH, 48 ppm DRO, and 0.037 ppm total BTEX with 0.019 ppm toluene, and 0.018 ppm xylenes. RPH is calculated to be 282 ppm. Sample MW3S6 had 87 ppm TPH and 0.045 ppm total BTEX with 0.005 ppm benzene, 0.026 ppm toluene, and 0.014 ppm xylenes. RPH is calculated to be 87 ppm. Sample MW3S11 had 15 ppm TPH and 0.028 ppm total BTEX with 0.006 ppm benzene, 0.014 ppm toluene, and 0.008 ppm xylenes. RPH is calculated to be 15 ppm. Based on the results of the analytical testing, the soil in this area appears to be impacted by petroleum hydrocarbons, however the concentrations detected are less than the allowable levels.

Three soil samples collected from Boring MW4, Samples MW4S2, MW4S6, and MW4S10, were taken from depths of 10.0-11.5, 30.0-31.5, and 50.0-51.5 feet, respectively. Total BTEX of 0.039 ppm with 0.02 ppm toluene, and 0.019 ppm xylenes were detected in sample MW4S2. Sample MW4S10 had concentrations 0.031 ppm total BTEX with 0.017 ppm toluene and 0.014 ppm xylenes. Sample MW4S6 had 0.011 ppm toluene. Boring MW4 is located to the northwest of the pump island south of the service station building. Based on the results of the analytical testing, this area appears to be impacted by petroleum hydrocarbons, however the concentrations detected are less than the allowable levels.

Boring MW5 is the downgradient well and is also located west of the proposed new UST array at the subject site. Three soil samples collected from Boring MW5, Samples MW5S2,

MW5S7, and MW5S10, were taken from depths of 10.0-11.5, 35.0-36.5, and 50.0-51.5 feet, respectively. Sample MW5S2 was non-detectable for the analytical testing parameters. TPH, GRO and DRO detected in sample MW5S7 were reported in concentrations of 72 ppm, 7 ppm and 44 ppm, respectively. RPH is calculated to be 21 ppm. Sample MW5S10 had detectable concentrations of GRO and xylenes of 14 and 0.07 ppm, respectively. Based on the results of the analytical testing, this area appears to be impacted by petroleum hydrocarbons, however the concentrations detected are less than the allowable levels.

6.2 Groundwater

Sample MW1W1, taken from Monitoring Well MW1, had 1.4 ppm of GRO, 0.704 ppm of total BTEX with 0.49 ppm benzene, 0.094 ppm toluene, 0.022 ppm ethylbenzene, 0.098 ppm xylenes, and non-detectable levels of TPH. These concentrations exceed the ADEC allowable levels for GRO (0.1 ppm) and benzene (0.005 ppm) in groundwater.

Sample MW2W1, collected from Monitoring Well MW2, had 19 ppm GRO, 10.27 ppm of total BTEX with 3.1 ppm benzene, 4.5 ppm toluene, 0.47 ppm ethylbenzene, 2.2 ppm xylene, and 2 ppm TPH. A duplicate sample collected from MW2, designated MW2W1DUP had 21 ppm GRO, 11.21 ppm of total BTEX with 3.4 ppm benzene, 4.9 ppm toluene, 0.51 ppm ethylbenzene, 2.4 ppm xylenes, and 2 ppm TPH. These concentrations exceed the ADEC allowable levels for GRO (0.1 ppm), BTEX (10 ppm) and benzene (0.005 ppm) in groundwater.

Samples MW3W1 and MW4W1 collected from Monitoring Wells MW3 and MW4, respectively, had non-detectable concentrations for each of the analytical testing parameters.

Sample MW5W1, collected from Monitoring Well MW5, had 38 ppm GRO, 10.2 ppm of total BTEX with 1.5 ppm benzene, 4.2 ppm toluene, 0.8 ppm ethylbenzene, 3.7 ppm xylenes, and 2 ppm TPH. These concentrations exceed the ADEC allowable levels for GRO (0.1 ppm), BTEX (10 ppm), benzene (0.005 ppm), toluene (2 ppm) and ethylbenzene (0.7 ppm) in groundwater.

6.3 Quality Assurance and Quality Control

The soil and water samples for this project were analyzed at Superior Precision Analytical, Inc. and the results were presented in a Level 1 Data Deliverables report. This data package includes the analytical method used, uncorrected quantitative results, date and times of analyses,

chromatograms of the gas chromatograph analysis, calibration documents for instruments used, surrogate compound recovery data, narrative statements explaining any corrective action taken on reported data and laboratory quality control sample recovery data to document the precision and accuracy of the results. The information included in this Data Deliverables package was used to calculate whether the precision, accuracy and completeness of the analysis were performed within the boundaries of the data quality objectives. The data quality objectives for this project, are shown in our April 20, 1991 Quality Assurance Project Plan (QAPP) for UST Site Assessments which has been approved by the ADEC.

The precision, accuracy and completeness for the total petroleum hydrocarbons (TPH), gasoline range organics (GRO), diesel range organics (DRO), and aromatic volatile organics (BTEX) and the data quality objectives (DQO) for this project are as follows:

Parameter	Precision (DQO)%	Accuracy (DQO)%	Completeness (DQO)%
TPH	+/- 6 (+/-40)	117 (60-130)	100 (95)
DRO	+/- 2 (+/-40)	104 (60-130)	100 (95)
GRO	+/- 5 (+/-40)	94 (60-130)	100 (95)
BTEX-Soil	+/-11 (+/-40)	85-103 (60-130)	100 (95)
BTEX-Water	+/-3 (+/-40)	94-100 (60-140)	100 (95)

As indicated above, the data quality objectives for this project have been met.

A trip blank, consisting of organic free water and designated TB-LB, was prepared by Chemical and Geological Laboratory of Anchorage, Alaska. The trip blank accompanied the water samples from the time of collection in the field to the time of analyses of the water samples. The trip blank sample was analyzed for BTEX and was found to be non-detectable for those parameters.

Sample MW1AW1, a spike sample prepared by Chemical and Geological Laboratory, contained a known quantity of BTEX prior to its analyses at Superior Precision Analytical. The water sample was spiked with 0.05 ppm of each of the following parameters: benzene, toluene, ethylbenzene, p&m-xylenes and o-xylenes. Analytical results by Superior Precision Analytical for Sample MW1AW1 were 0.044 ppm benzene, 0.041 ppm toluene, 0.043 ppm ethylbenzene and 0.087 ppm total xylenes. The results of the BTEX analyses by Superior Precision Analytical had

accuracies ranging from 94 to 100 percent. These accuracies fall within our data quality objectives of 60 to 140 percent.

6.4 Drill Cuttings and Purged Groundwater Disposal

Two (2) 55 gallon drums and seven (7) 3-ton sacks of drill cuttings and five (5) drums of purged groundwater were generated during the assessment activities. These drums and sacks are presently being stored on-site, at the northwest corner of the paved parking area. The drums/sacks are marked with the appropriate boring and monitoring well number.

Analytical soil samples from Borings MW3, MW4, and MW5 had GRO and BTEX concentrations below ADEC Level A cleanup guidelines (Table 4). The disposal of drill cuttings from these borings will likely be allowed by surface spreading. Analytical soil samples from Borings B1, B2, MW1 and MW2 had GRO and BTEX concentrations which exceed ADEC cleanup guidelines. The disposal of drill cuttings from these borings will be accomplished at an approved disposal facility after authorization from the ADEC.

The analytical groundwater samples from Monitoring Wells MW3 and MW4 had non-detectable levels of TPH and BTEX. Disposal of the groundwater purged from these wells can be accomplished by pouring the water onto the site surface. The analytical groundwater samples from Monitoring Wells MW1, MW2, and MW5 had detectable levels of TPH, GRO, and BTEX which exceed ADEC cleanup guidelines. Disposal of the groundwater purged from these wells will be accomplished at Alaska Pollution Control.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the data presented herein and our interpretations of the subsurface conditions at the Chevron Service Station at the 303 West Fireweed site, the gasoline range organics, diesel range organics and/or BTEX concentrations in the subsurface soils samples from Borings B1, B2, MW1 and MW2 exceed the Level A ADEC Cleanup Guidelines shown on the ADEC March 25, 1991, Cleanup Matrix Score Sheet. The impacted soils extend downward to varying depths and were detected at a maximum depth of 35.5 feet in MW2.

Impacted groundwater with levels of petroleum hydrocarbon constituents exceeding established State and Federal MCLs for drinking water were detected in the samples from Monitoring Wells MW1, MW2, and MW5.

The direction of groundwater flow across the site was determined to be in the northwest direction which would place all of the boring/monitoring well locations downgradient of either the former UST array or the associated pump island dispensers. The GRO and BTEX levels in MW1 and MW5, which are located directly downgradient of the UST array, do not appear to indicate that a large loss of product could have occurred from the UST array system. Monitoring Well MW2, which is directly downgradient from the eastern most pump island, had detectable gasoline-type petroleum hydrocarbons in the soil and groundwater. It appears that the gasoline impacted soil and groundwater could be the result of releases from the product lines associated with the pump island area.

In accordance with the March 25, 1991 UST Emergency Regulations the ADEC must be notified if the test results indicate that the cleanup levels for either soils or groundwater have been exceeded. We recommend that you submit a copy of this report to the ADEC.

8.0 CLOSURE/LIMITATIONS

Five groundwater monitoring wells were installed as part of this project. When you no longer need the monitoring wells we recommend that the wells be abandoned according to Alaska Statute 18ACC80.020c.

This report was prepared for the exclusive use of Chevron USA Inc., and their representatives, in the study of this site. The findings we have presented within this report are based on limited research and on the sampling analysis that we conducted at this site. They should not be construed as a definite conclusion regarding the soils and groundwater quality at this site. It is possible that our subsurface tests may have missed some higher levels of petroleum hydrocarbon constituents, although our intention was to sample areas likely to be impacted. As a result, the analysis and sampling performed can only provide you with our best judgement as to the environmental characteristics of this site, and in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should be considered representative of the time of our site assessment. Changes in the conditions of this site can occur with passage of time, whether they be due to natural processes or the works of man on

this site. In addition, changes in Government Codes, regulations, or laws may occur. Due to such changes, our observations and recommendations applicable to this site may need to be revised wholly or in part, due to changes beyond our control.

You are advised that various state and federal agencies (ADEC, EPA, etc.) may require the reporting of this information. Shannon and Wilson does not assume the responsibility for reporting these findings and therefore, has not, and will not, disclose the results of this study.

We appreciate this opportunity to be of service. Please call the undersigned with any questions or comments concerning the contents of this report.

Sincerely,

SHANNON & WILSON, INC.

Prepared By:

Timothy M. Terry
Associate Engineering Geologist

TMT/LCR/mac

Approved By:

Fred R. Brown, P.E.
Vice President

TABLE 1 - SAMPLE LOCATIONS AND DESCRIPTIONS

SOIL SAMPLES

Sample Number	Date	Sample Location (See Figure 1 and Table 2)	Depth (Ft)	Sample Classification
B1S1	8/13/92	Boring No. 1, Sample No. 1	0.0-1.5	Brown, silty, sandy GRAVEL
B1S2	8/13/92	Boring No. 1, Sample No. 2	5.0-6.5	Brown, silty, sandy GRAVEL
B1S3	8/13/92	Boring No. 1, Sample No. 3	10.0-11.5	Brown, silty, gravelly SAND
B1S4	8/13/92	Boring No. 1, Sample No. 4	15.0-15.5	Brown, slightly silty SAND w/trace gravel & coal
B1S5	8/13/92	Boring No. 1, Sample No. 5	20.0-21.5	Brown, gravelly SAND
B1S6	8/13/92	Boring No. 1, Sample No. 6	25.0-26.5	Brown, silty, gravelly SAND
B1S7	8/13/92	Boring No. 1, Sample No. 7	30.0-31.5	Brown, silty, gravelly SAND w/coal
B2S1	8/13/92	Boring No. 2, Sample No. 1	5.0-6.5	Brown, silty, sandy GRAVEL
B2S2	8/13/92	Boring No. 2, Sample No. 2	10.0-11.5	Brown, silty, sandy GRAVEL
B2S3	8/13/92	Boring No. 2, Sample No. 3	15.0-16.5	Brown, gravelly SAND
B2S4	8/13/92	Boring No. 2, Sample No. 4	20.0-21.5	Brown, silty, sandy GRAVEL w/coal
B2S5	8/13/92	Boring No. 2, Sample No. 5	25.0-26.5	Brown, silty SAND
B2S6	8/13/92	Boring No. 2, Sample No. 6	30.0-31.5	Brown, silty SAND
MW1S1	8/12/92	Boring No. MW1, Sample No. 1	5.0-6.5	Brown to gray, gravelly SAND
MW1S2	8/12/92	Boring No. MW1, Sample No. 2	10.0-11.5	Brown to gray, gravelly SAND
MW1S3	8/18/92	Boring No. MW1, Sample No. 3	15.0-16.5	Brown to gray, gravelly SAND
MW1S4	8/18/92	Boring No. MW1, Sample No. 4	20.0-21.5	Brown to gray, gravelly SAND
MW1S5	8/18/92	Boring No. MW1, Sample No. 5	25.0-26.5	Greenish brown, SAND
MW1S6	8/18/92	Boring No. MW1, Sample No. 6	30.0-31.5	Greenish brown, SAND
MW1S7	8/18/92	Boring No. MW1, Sample No. 7	35.0-36.5	Greenish brown, SAND
MW1S8	8/18/92	Boring No. MW1, Sample No. 8	40.0-41.5	Brown to gray, gravelly SAND
MW1S9	8/18/92	Boring No. MW1, Sample No. 9	45.0-46.5	Gray, SAND w/trace gravel
MW1S10	8/18/92	Boring No. MW1, Sample No. 10	50.0-51.5	Gray, SAND w/trace clay and coal
MW2S1	8/24/92	Boring No. MW2, Sample No. 1	4.0-5.5	Brown to gray, gravelly SAND
MW2S2	8/24/92	Boring No. MW2, Sample No. 2	9.0-10.5	Brown to gray, gravelly SAND
MW2S3	8/24/92	Boring No. MW2, Sample No. 3	14.0-15.5	Brown to gray, gravelly SAND
MW2S4	8/24/92	Boring No. MW2, Sample No. 4	19.0-20.5	Brown to gray, gravelly SAND
MW2S5	8/24/92	Boring No. MW2, Sample No. 5	24.0-25.5	Brown to gray, gravelly SAND
MW2S6	8/24/92	Boring No. MW2, Sample No. 6	29.0-30.5	Brown, silty SAND w/ silt lenses
MW2S7	8/24/92	Boring No. MW2, Sample No. 7	34.0-35.5	Brown, sandy SILT
MW2S8	8/24/92	Boring No. MW2, Sample No. 8	39.0-40.5	Brown to gray, gravelly SAND
MW2S9	8/24/92	Boring No. MW2, Sample No. 9	44.0-45.5	Brown, silty SAND w/ silt lenses
MW2S10	8/24/92	Boring No. MW2, Sample No. 10	49.0-50.0	Gray, SAND
MW2S11	8/24/92	Boring No. MW2, Sample No. 11	52.0-53.5	Gray, silty, fine SAND
MW3S1	8/25/92	Boring No. MW3, Sample No. 1	4.0-5.5	Brown to gray, gravelly SAND
MW3S2	8/25/92	Boring No. MW3, Sample No. 2	9.0-10.5	Brown to gray, gravelly SAND
MW3S3	8/25/92	Boring No. MW3, Sample No. 3	14.0-15.5	Brown to gray, gravelly SAND
MW3S4	8/25/92	Boring No. MW3, Sample No. 4	19.0-20.5	Brown to gray, gravelly SAND
MW3S5	8/25/92	Boring No. MW3, Sample No. 5	24.0-25.5	Brown to gray, gravelly SAND w/coal

0035

TABLE 1 - SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location (See Figure 1 and Table 2)	Depth (Ft)	Sample Classification
MW3S6	8/25/92	Boring No. MW3, Sample No. 6	29.0-30.5	Brown to gray, gravelly SAND w/silt lenses
MW3S7	8/25/92	Boring No. MW3, Sample No. 7	34.0-35.5	Brown to gray, gravelly SAND w/coal and silt lenses
MW3S8	8/25/92	Boring No. MW3, Sample No. 8	39.0-40.5	Brown to gray, gravelly SAND
MW3S9	8/25/92	Boring No. MW3, Sample No. 9	44.0-45.5	Brown to gray, gravelly SAND w/silt lenses
MW3S10	8/25/92	Boring No. MW3, Sample No. 10	49.0-50.0	Gray, silty SAND
MW3S11	8/25/92	Boring No. MW3, Sample No. 11	52.5-53.5	Gray, silty SAND
MW4S1	8/24/92	Boring No. MW4, Sample No. 1	4.0-5.5	Brown to gray, gravelly SAND
MW4S2	8/24/92	Boring No. MW4, Sample No. 2	10.0-11.5	Brown to gray, gravelly SAND w/coal
MW4S3	8/24/92	Boring No. MW4, Sample No. 3	15.0-16.5	Brown to gray, gravelly SAND w/coal
MW4S4	8/24/92	Boring No. MW4, Sample No. 4	20.0-21.5	Brown to gray, gravelly SAND
MW4S5	8/24/92	Boring No. MW4, Sample No. 5	25.0-26.5	Brown to gray, gravelly SAND
MW4S6	8/24/92	Boring No. MW4, Sample No. 6	30.0-31.5	Brown, sandy SILT
MW4S7	8/24/92	Boring No. MW4, Sample No. 7	35.0-36.5	Brown to gray, gravelly SAND
MW4S8	8/24/92	Boring No. MW4, Sample No. 8	40.0-41.5	Brown, sandy SILT
MW4S9	8/24/92	Boring No. MW4, Sample No. 9	45.0-46.5	Brown to gray, gravelly SAND
MW4S10	8/24/92	Boring No. MW4, Sample No. 10	50.0-51.5	Gray, SAND
MW5S1	8/17/92	Boring No. MW5, Sample No. 1	5.0-6.5	Brown to gray, SAND w/trace gravel
MW5S2	8/17/92	Boring No. MW5, Sample No. 2	10.0-11.5	Brown to gray, SAND w/trace gravel
MW5S3	8/17/92	Boring No. MW5, Sample No. 3	15.0-16.5	Brown to gray, SAND w/trace gravel
MW5S4	8/17/92	Boring No. MW5, Sample No. 4	20.0-21.5	Brown to gray, SAND w/trace gravel
MW5S5	8/17/92	Boring No. MW5, Sample No. 5	25.0-26.5	Brown, SAND
MW5S6	8/17/92	Boring No. MW5, Sample No. 6	30.0-31.5	Brown, SAND w/coal
MW5S7	8/17/92	Boring No. MW5, Sample No. 7	35.0-36.5	Brown to gray, gravelly SAND
MW5S8	8/17/92	Boring No. MW5, Sample No. 8	40.0-41.5	Brown to gray, gravelly SAND
MW5S9	8/17/92	Boring No. MW5, Sample No. 9	45.0-46.5	Brown to gray, SAND w/trace gravel
MW5S10	8/17/92	Boring No. MW5, Sample No. 10	50.0-51.5	Greenish gray, sandy GRAVEL

WATER SAMPLES

Water Number	Date	Sample Location (See Figure 1 and Table 2)	Depth (Ft)	Sample Classification
MW1W1	8/29/92	Boring No. 1, Monitoring Well, Sample No. 1	46	Groundwater
MW2W1	8/28/92	Boring No. 2, Monitoring Well, Sample No. 1	45.5	Groundwater
MW3W1	8/29/92	Boring No. 3, Monitoring Well, Sample No. 1	46	Groundwater
MW4W1	8/29/92	Boring No. 4, Monitoring Well, Sample No. 1	45	Groundwater
MW5W1	8/27/92	Boring No. 5, Monitoring Well, Sample No. 1	47	Groundwater
MW2W1DUP	8/29/92	Boring No. 2, Monitoring Well, Sample No. 1	45.5	Groundwater
MW1AW1	8/29/92	Sample spike for Method 8020/602	- -	Spiked organic-free water
TB-LB	8/29/92	Trip Blank	- -	Organic-free water

0036

TABLE 2 - SUMMARY OF HEADSPACE SCREENING AND ANALYTICAL RESULTS

		Headspace Sample Number (See Table 1 and Figure 1)							
Parameter Tested	Method	B1S1	B1S2	B1S3	B1S4	B1S5	B1S6	B1S7	B2S1
PID Headspace Reading - ppm	OVM 580B	27.8	28.2	5.1	1.7	4.7	8.4	43.5	15.1

		Headspace Sample Number (See Table 1 and Figure 1)							
Parameter Tested	Method	B2S2	B2S3	B2S4	B2S5	B2S6	MW1S1	MW1S2	MW1S3
PID Headspace Reading - ppm	OVM 580B	4.3	66.7	23.1	240.1	802	0	1	3

		Headspace Sample Number (See Table 1 and Figure 1)							
Parameter Tested	Method	MW1S4	MW1S5	MW1S6	MW1S7	MW1S8	MW1S9	MW1S10	MW2S1
PID Headspace Reading - ppm	OVM 580B	22	235	500	62	58	52	5	1

		Headspace Sample Number (See Table 1 and Figure 1)							
Parameter Tested	Method	MW2S2	MW2S3	MW2S4	MW2S5	MW2S6	MW2S7	MW2S8	MW2S9
PID Headspace Reading - ppm	OVM 580B	1	0	3	83	507	643	438	484

		Headspace Sample Number (See Table 1 and Figure 1)							
Parameter Tested	Method	MW2S10	MW2S11	MW3S1	MW3S2	MW3S3	MW3S4	MW3S5	MW3S6
PID Headspace Reading - ppm	OVM 580B	431	128	2	8	4	6	1	3

		Headspace Sample Number (See Table 1 and Figure 1)							
Parameter Tested	Method	MW3S7	MW3S8	MW3S9	MW3S10	MW3S11	MW4S1	MW4S2	MW4S3
PID Headspace Reading - ppm	OVM 580B	3	0	0	1	1	0	3	0

		Headspace Sample Number (See Table 1 and Figure 1)							
Parameter Tested	Method	MW4S4	MW4S5	MW4S6	MW4S7	MW4S8	MW4S9	MW4S10	MW5S1
PID Headspace Reading - ppm	OVM 580B	1	4	1	0	1	1	1	0

		Headspace Sample Number (See Table 1 and Figure 1)							
Parameter Tested	Method	MW5S2	MW5S3	MW5S4	MW5S5	MW5S6	MW5S7	MW5S8	MW5S9
PID Headspace Reading - ppm	OVM 580B	0	0	0	1	38	271	519	622

		Headspace Sample Number (See Table 1 and Figure 1)							
Parameter Tested	Method	MW5S10							
PID Headspace Reading - ppm	OVM 580B	476							

0037

TABLE 2 - SUMMARY OF HEADSPACE SCREENING AND ANALYTICAL RESULTS

		Analytical Sample Number (See Table 1, Figure 1 and Appendix A) Soil Samples							
Parameter Tested	Method*	B1S2	B1S5	B1S7	B2S1	B2S3	B2S6	MW1S2	MW1S6
PID Headspace Reading - ppm	OVM 580B	28.2	4.7	43.5	4.3	66.7	802	1	500
Total Petroleum Hydrocarbons (TPH) - ppm	EPA 418.1	570	ND	ND	85	ND	62	300	ND
Gasoline Range Organics (GRO) - ppm	EPA 5030/8015	6	ND	13	ND	3	1800	ND	77
Diesel Range Organics (DRO) - ppm	EPA 3550/8100	560	ND	ND	ND	ND	26	25	17
Residual Range Petroleum Hydrocarbons (RPH) - ppm	**	4	ND	ND	85	ND	ND	275	ND
Aromatic Volatile Organics	EPA 8020								
Benzene - ppm	EPA 8020	ND	ND	ND	ND	ND	2.1	ND	0.22
Toluene - ppm	EPA 8020	ND	ND	0.25	ND	ND	5.2	ND	1.6
Ethylbenzene - ppm	EPA 8020	ND	ND	0.24	ND	ND	13	ND	0.97
Xylenes - ppm	EPA 8020	0.06	ND	1.7	0.09	0.16	71	ND	7.7
Total BTEX	EPA 8020	0.06	ND	2.19	0.09	0.16	91.3	ND	10.49

		Analytical Sample Number (See Table 1, Figure 1 and Appendix A) Soil Samples							
Parameter Tested	Method*	MW1S9	MW2S2	MW2S7	MW2S11	MW3S2	MW3S6	MW3S11	MW4S2
PID Headspace Reading - ppm	OVM 580B	52	1	643	128	8	3	1	3
Total Petroleum Hydrocarbons (TPH) - ppm	EPA 418.1	ND	17	150	ND	330	87	15	ND
Gasoline Range Organics (GRO) - ppm	EPA 5030/8015	3	ND	1100	ND	ND	ND	ND	ND
Diesel Range Organics (DRO) - ppm	EPA 3550/8100	ND	ND	ND	ND	48	ND	ND	ND
Residual Range Petroleum Hydrocarbons (RPH) - ppm	**	ND	17	ND	ND	282	87	15	ND
Aromatic Volatile Organics	EPA 8020								
Benzene - ppm	EPA 8020	ND	ND	0.84	0.012	ND	0.005	0.006	ND
Toluene - ppm	EPA 8020	ND	ND	42	0.046	0.019	0.026	0.014	0.02
Ethylbenzene - ppm	EPA 8020	ND	ND	30	0.013	ND	ND	ND	ND
Xylenes - ppm	EPA 8020	0.16	0.006	170	0.075	0.018	0.014	0.008	0.019
Total BTEX	EPA 8020	0.16	0.006	242.84	0.146	0.037	0.045	0.028	0.039

KEY	DESCRIPTION
NA	SAMPLE NOT ANALYZED FOR THIS PARAMETER
ND	NOT DETECTED
*	SEE APPENDIX A FOR LIMITS OF DETECTION
**	RPH = TPH - DRO - GRO

0038

TABLE 2 - SUMMARY OF HEADSPACE SCREENING AND ANALYTICAL RESULTS

		Analytical Sample Number (See Table 1, Figure 1 and Appendix A) Soil Samples							
Parameter Tested	Method*	MW4S6	MW4S10	MW5S2	MW5S7	MW5S10			
PID Headspace Reading	OVM 580B	11	1	0	271	476			
Total Petroleum Hydrocarbons (TPH) - ppm	EPA 418.1	ND	ND	ND	72	ND			
Gasoline Range Organics (GRO) - ppm	EPA 5030/8015	ND	ND	ND	7	14			
Diesel Range Organics (DRO) - ppm	EPA 3550/8100	ND	ND	ND	44	ND			
Residual Range Petroleum Hydrocarbons (RPH) - ppm	**	ND	ND	ND	21	ND			
Aromatic Volatile Organics	EPA 8020								
Benzene - ppm	EPA 8020	ND	ND	ND	ND	ND			
Toluene - ppm	EPA 8020	0.011	0.017	ND	ND	ND			
Ethylbenzene - ppm	EPA 8020	ND	ND	ND	ND	ND			
Xylenes - ppm	EPA 8020	ND	0.014	ND	ND	0.07			
Total BTEX	EPA 8020	0.011	0.031	ND	ND	0.07			

		Analytical Sample Number (See Table 1, Figure 1 and Appendix A) Water Samples							
Parameter Tested	Method*	MW1W1	MW2W1	MW3W1	MW4W1	MW5W1	MW2W1DUP	MW1AW1	TB-LB
Total Petroleum Hydrocarbons - ppm	EPA 418.1	ND	2	ND	ND	2	2	NA	NA
Gasoline Range Organics - ppm	EPA 5030/8015	1.4	19	ND	ND	38	21	NA	NA
Diesel Range Organics - ppm	EPA 3550/8100	NA	NA	NA	NA	NA	NA	NA	NA
Aromatic Volatile Organics	EPA 602								
Benzene - ppm	EPA 602	0.49	3.1	ND	ND	1.5	3.4	0.044	ND
Toluene - ppm	EPA 602	0.094	4.5	ND	ND	4.2	4.9	0.041	ND
Ethylbenzene - ppm	EPA 602	0.022	0.47	ND	ND	0.8	0.51	0.043	ND
Xylenes - ppm	EPA 602	0.098	2.2	ND	ND	3.7	2.4	0.087	ND
Total BTEX	EPA 602	0.704	10.27	ND	ND	10.2	11.21	0.215	ND

KEY	DESCRIPTION
NA	SAMPLE NOT ANALYZED FOR THIS PARAMETER
ND	NOT DETECTED
*	SEE APPENDIX A FOR LIMITS OF DETECTION
**	RPH = TPH - DRO - GRO

TABLE 3 - WATER SAMPLING LOG

POTENTIOMETRIC SURFACE DETERMINATION

WELL NUMBER	MW1	MW2	MW3	MW4	MW5
DATE WATER LEVEL MEASURED	9/8/92	9/8/92	9/8/92	9/8/92	9/8/92
TIME WATER LEVEL MEASURED	11:58	11:44	11:48	9:52	11:56
MP ELEVATION, FT	97.90	98.57	99.16	98.60	98.89
DEPTH TO WATER BELOW MP, FT	45.54	45.19	45.83	44.92	46.89
WATER LEVEL ELEVATION, FT	52.36	53.38	53.33	53.68	52.00

SAMPLING/DEVELOPING DATA

WELL NUMBER	MW1	MW2	MW3	MW4	MW5
WATER COLUMN IN WELL, FT	3.41	5.88	5.91	6.27	5.85
GALLONS PER FOOT	0.65	0.65	0.65	0.65	0.65
GALLONS IN WELL	2.22	3.82	3.84	4.08	3.80
TOTAL GALLONS PUMPED/BAILED	20	32	45	50	30
TEMPERATURE, C	7.1	6.4	6.4	6.7	6.4
SPECIFIC CONDUCTANCE, UMHOS/CM	450	580	550	500	500
pH	6.75	6.90	6.80	6.90	6.80
REMARKS					

Diameter of Casing: 4 inch
Development Method: Brainard-Kilman/Shindawa Pump
Purging & Sampling Method: Voss Disposable Bailer
Sampling Personnel: Jim Zschau

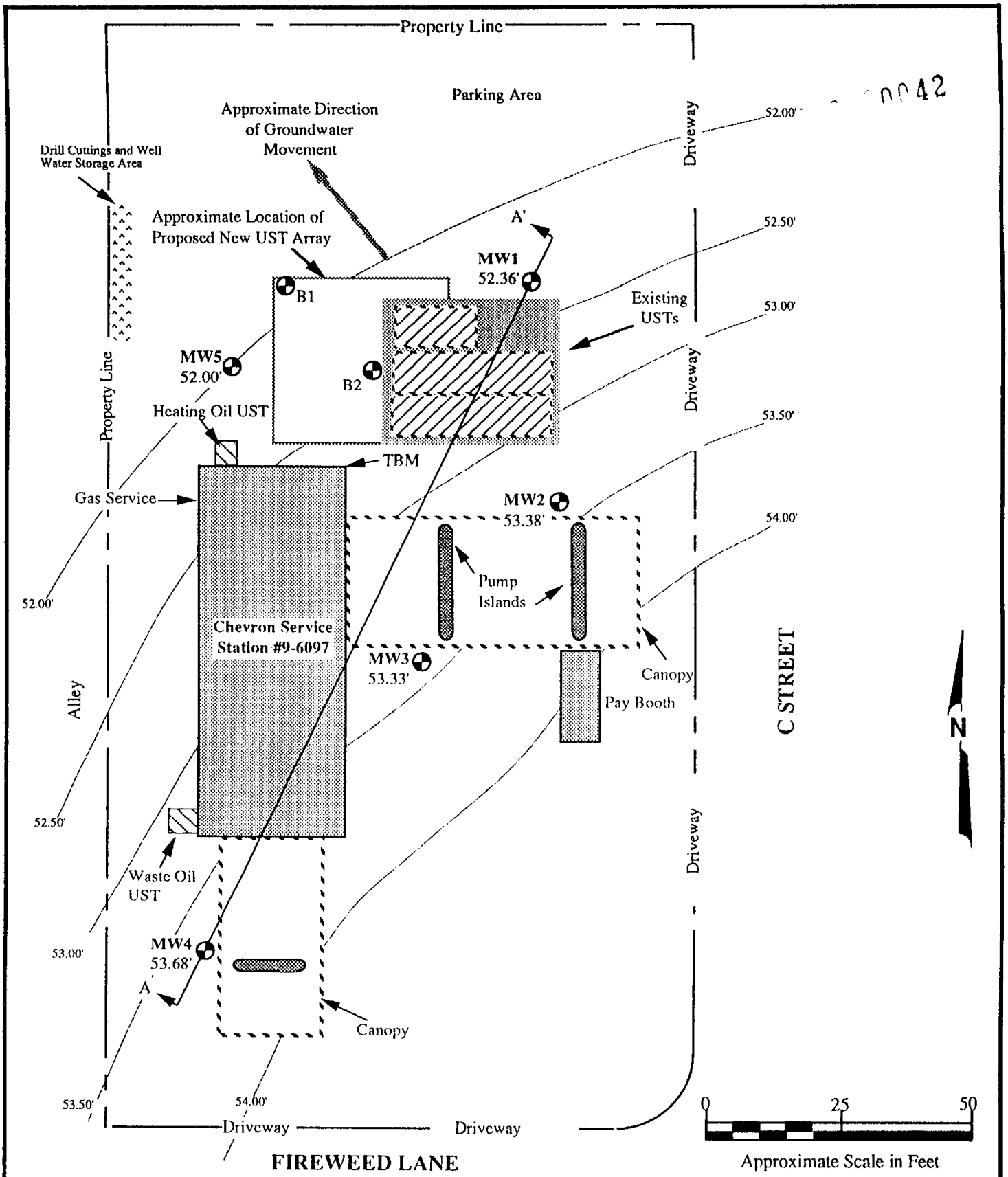
KEY
MP=Measuring Point
NM=Not Measured

0040

TABLE 4 - ADEC MATRIX SCORE SHEET

1. Depth to Subsurface Water		**8**
	< 5 feet	[10]
	5-15 feet	[8]
	15-25 feet	[6]
	25-50 feet	[4]
	> 50 feet	[1]
2. Mean Annual Precipitation		**3**
	>40 inches	[10]
	25-40 inches	[5]
	15-25 inches	[3]
	<15 inches	[1]
3. Soil Type (Unified Soil Classification)		**10**
	Clean, coarse-grained soils	[10]
	Coarse-grained soils with fines	[8]
	Fine-grained soils (low OC)	[3]
	Fine-grained soils (high OC)	[1]
4. Potential Receptors		**15**
	Public well within 1000 feet, or	
	Private well(s) within 500 feet	[15]
	Municipal/priv well w/i 1/2 mi	[12]
	Municipal/priv well w/i 1 mile	[8]
	No known well within 1/2 mile	[6]
	No known well within 1 mile	[4]
	Non-potable groundwater	[1]
5. Volume of Contaminated Soil		**10**
	>500 cubic yards	[10]
	100-500 cubic yards	[8]
	25-100 cubic yards	[5]
	>De Minimis-25 cubic yards	[2]
	De Minimis	[0]

	Cleanup Level in mg/kg			
	Diesel	Gasoline/unknown		
Matrix Score 46	diesel range petroleum hydrocarbons	gasoline range petroleum hydrocarbons	Benzene	BETX
Level A >40	100	50	0.1	10
Level B 27-40	200	100	0.5	15
Level C 21-26	1000	500	0.5	50
Level D <20	2000	1000	0.5	100



MW5 52.00' — Number and location of boring/monitoring well by Shannon & Wilson, August, 1992; water level elevation = 52.00 feet

TBM — Temporary bench mark with assumed elevation of 100.00 feet

52.00' — Groundwater potentiometric surface contour and approximate elevation (ft); based on TBM at 100.00 ft (8/92 Survey)

A-A' — Location of subsurface profile A-A'; see Figure 10

303 West Fireweed Lane
Anchorage, Alaska

SITE PLAN

September, 1992 Y-5144

SHANNON & WILSON, INC.
Geotechnical Consultants

Fig. 1

SOIL DESCRIPTION Surface Elevation: 98.74'	DEPTH, ft.	SAMPLES
Asphalt Pavement	0.25	S-1
Dense, brown, silty, sandy GRAVEL; moist		
Dense, brown, silty, sandy GRAVEL; moist		S-2
	7.5	
Medium dense, brown, silty, gravelly SAND; moist		S-3
Very dense, brown, slightly silty SAND w/trace gravel & coal; moist		S-4
Very dense, brown, gravelly SAND; moist		S-5
Very dense, brown, silty, gravelly SAND; moist		S-6
Very dense, brown, silty, gravelly SAND w/ coal; moist		S-7
	31.5	
Bottom of Boring Completed 8/13/92		

GROUND WATER DEPTH, ft.

Groundwater Not Encountered During Drilling

Photoionization Detector Headspace Reading (ppm) ▲

0 200 400 600

0 10 20 30

92 84 77 112

0 20 40 60

Modified Penetration Resistance
340 lb. weight, 30" drop
● Blows per foot

LEGEND

B Bulk sample

3" O.D. split spoon sample

3" O.D. thin-wall sample

* Sample not recovered

Frozen

Impervious seal

Water level

Slotted pipe

MONITORING WELL DETAILS

2-INCH PVC PIPE IN ALUMINUM CASING; TOTAL LENGTH: Not Installed; STICKUP: NA; MACHINE CUT, 0.020" SLOTTED PIPE: NA #8-12 SAND: NA; #20-40 SAND: NA; BENTONITE: NA; CEMENT GROUT: NA; PADLOCK: NA

NOTE: The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.

303 West Fireweed Lane
Anchorage, Alaska

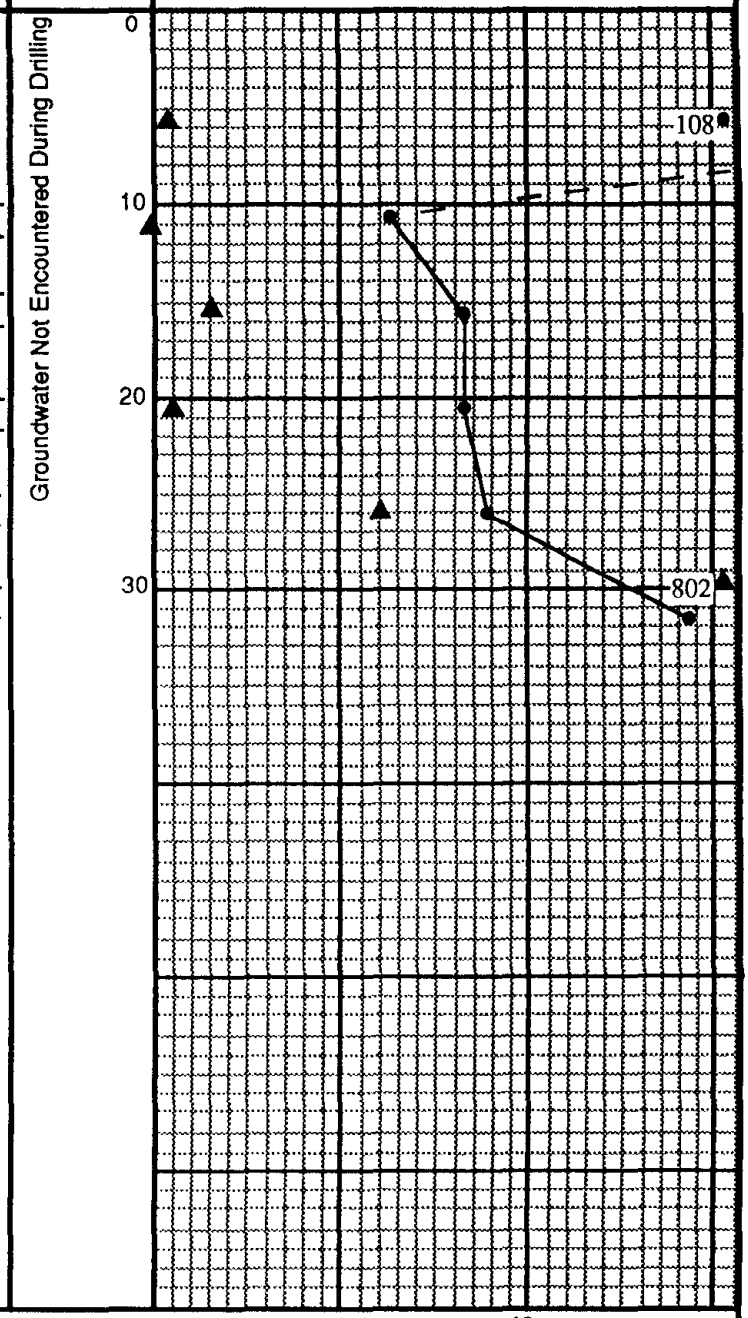
LOG OF BORING NO. B-1

September, 1992 Y-5144

SHANNON & WILSON, INC.
Geotechnical Consultants

FIG. 2

SOIL DESCRIPTION Surface Elevation: 99.25'	DEPTH, ft.	SAMPLES
Asphalt Pavement	0.25	
Very dense, brown silty, sandy GRAVEL; moist		S-1
Medium dense, brown, silty, sandy GRAVEL; moist		S-2
	13.5	
Medium dense, brown, silty, gravelly SAND w/coal; moist		S-3
Medium dense, brown, gravelly SAND; moist		S-4
Dense, brown, silty SAND; moist		S-5
Very dense, brown, silty SAND; moist	31.5	S-6
Bottom of Boring Completed 8/13/92		



LEGEND

- B — Bulk sample
- I — 3" O.D. split spoon sample
- II — 3" O.D. thin-wall sample
- * — Sample not recovered
- Frozen
- Impervious seal
- Water level
- Slotted pipe

MONITORING WELL DETAILS

2-INCH PVC PIPE IN ALUMINUM CASING; TOTAL LENGTH: Not Installed; STICKUP: NA; MACHINE CUT, 0.020" SLOTTED PIPE: NA #8-12 SAND: NA; #20-40 SAND: NA; BENTONITE: NA; CEMENT GROUT: NA; PADLOCK: NA

NOTE: The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.

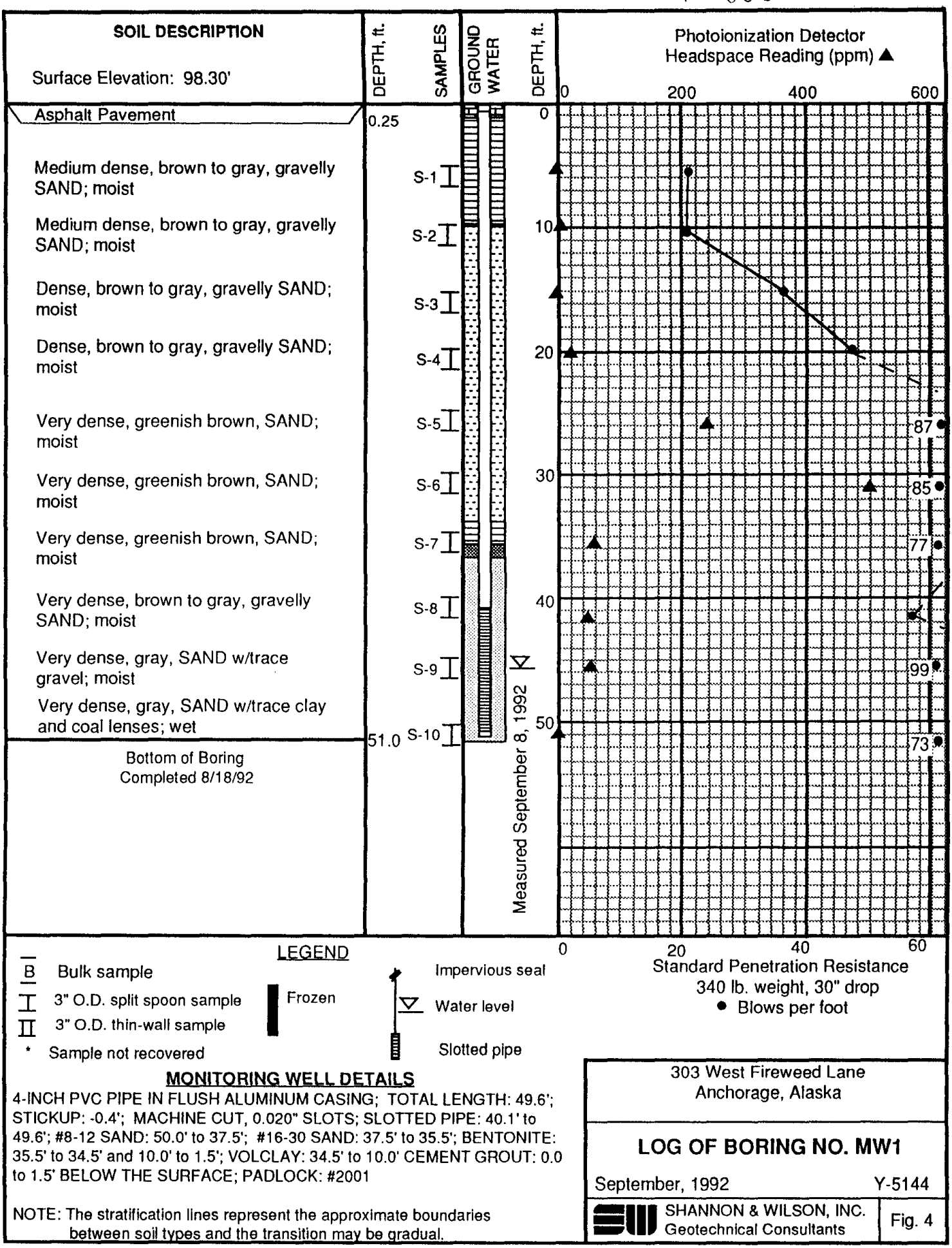
303 West Fireweed Lane
Anchorage, Alaska

LOG OF BORING NO. B-2

September, 1992 Y-5144

SHANNON & WILSON, INC.
Geotechnical Consultants

FIG. 3



MONITORING WELL DETAILS

4-INCH PVC PIPE IN FLUSH ALUMINUM CASING; TOTAL LENGTH: 49.6'; STICKUP: -0.4'; MACHINE CUT, 0.020" SLOTS; SLOTTED PIPE: 40.1' to 49.6'; #8-12 SAND: 50.0' to 37.5'; #16-30 SAND: 37.5' to 35.5'; BENTONITE: 35.5' to 34.5' and 10.0' to 1.5'; VOLCLAY: 34.5' to 10.0' CEMENT GROUT: 0.0 to 1.5' BELOW THE SURFACE; PADLOCK: #2001

NOTE: The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.

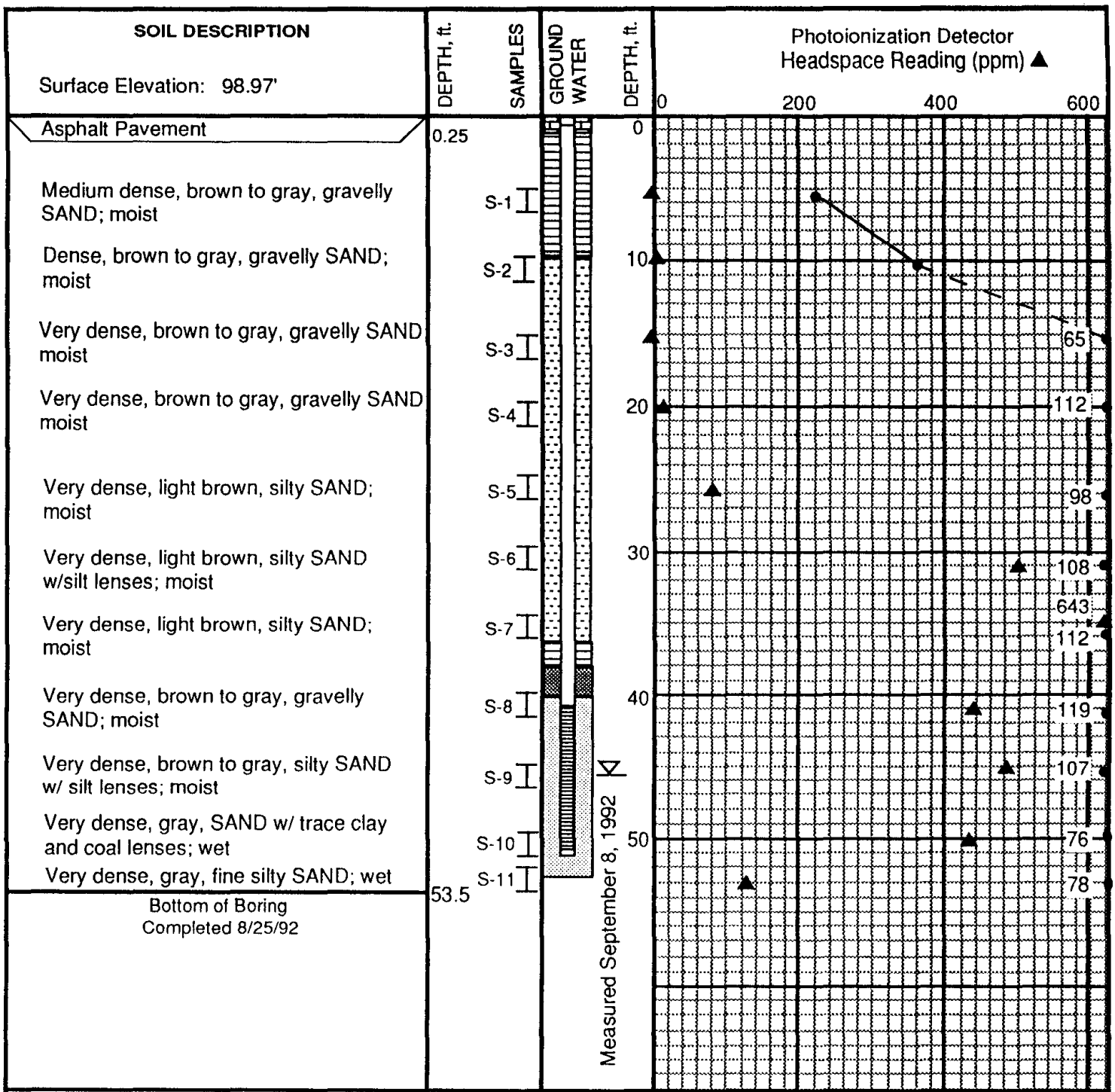
303 West Fireweed Lane
Anchorage, Alaska

LOG OF BORING NO. MW1

September, 1992 Y-5144

SHANNON & WILSON, INC.
Geotechnical Consultants

Fig. 4



MONITORING WELL DETAILS

4-INCH PVC PIPE IN FLUSH ALUMINUM CASING; TOTAL LENGTH: 52.16'; STICKUP: -0.4'; MACHINE CUT, 0.020" SLOTS; SLOTTED PIPE: 42.0' to 51.5'; #8-12 SAND: 52.5' to 40.0'; #16-30 SAND: 52.5' to 40.0'; BENTONITE: 38.0' to 36.5' and 9.5' to 1.5'; VOLCLAY: 36.5' to 9.5' ;#8-12 SAND: 1.5' to 0.7'; CEMENT GROUT: 0.7 to 0.0' BELOW THE SURFACE; PADLOCK: #2001

NOTE: The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.

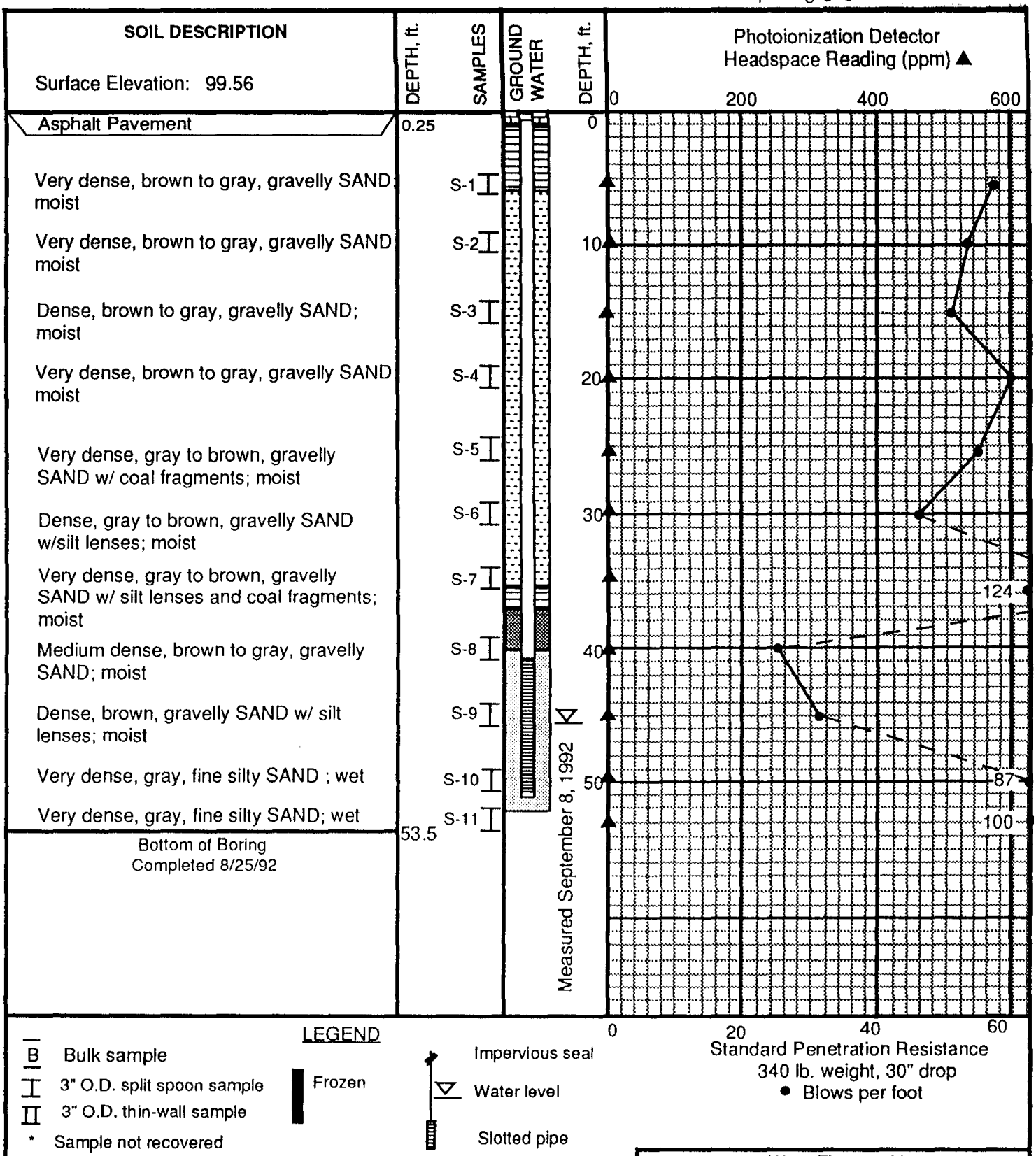
303 West Fireweed Lane
Anchorage, Alaska

LOG OF BORING NO. MW2

September, 1992 Y-5144

SHANNON & WILSON, INC.
Geotechnical Consultants

Fig. 5



MONITORING WELL DETAILS

4-INCH PVC PIPE IN FLUSH ALUMINUM CASING; TOTAL LENGTH: 52.06'; STICKUP: -0.4'; MACHINE CUT, 0.020" SLOTS; SLOTTED PIPE: 42.3 to 51.8'; #8-12 SAND: 52.5' to 40.0'; #16-30 SAND: 40.0' to 37.0'; BENTONITE: 37.0' to 35.5' and 6.0' to 1.5'; VOLCLAY: 35.5' to 6.0' ;#8-12 SAND: 1.5' to 0.5'; CEMENT GROUT: 0.5 to 0.0' BELOW THE SURFACE; PADLOCK: #2001

NOTE: The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.

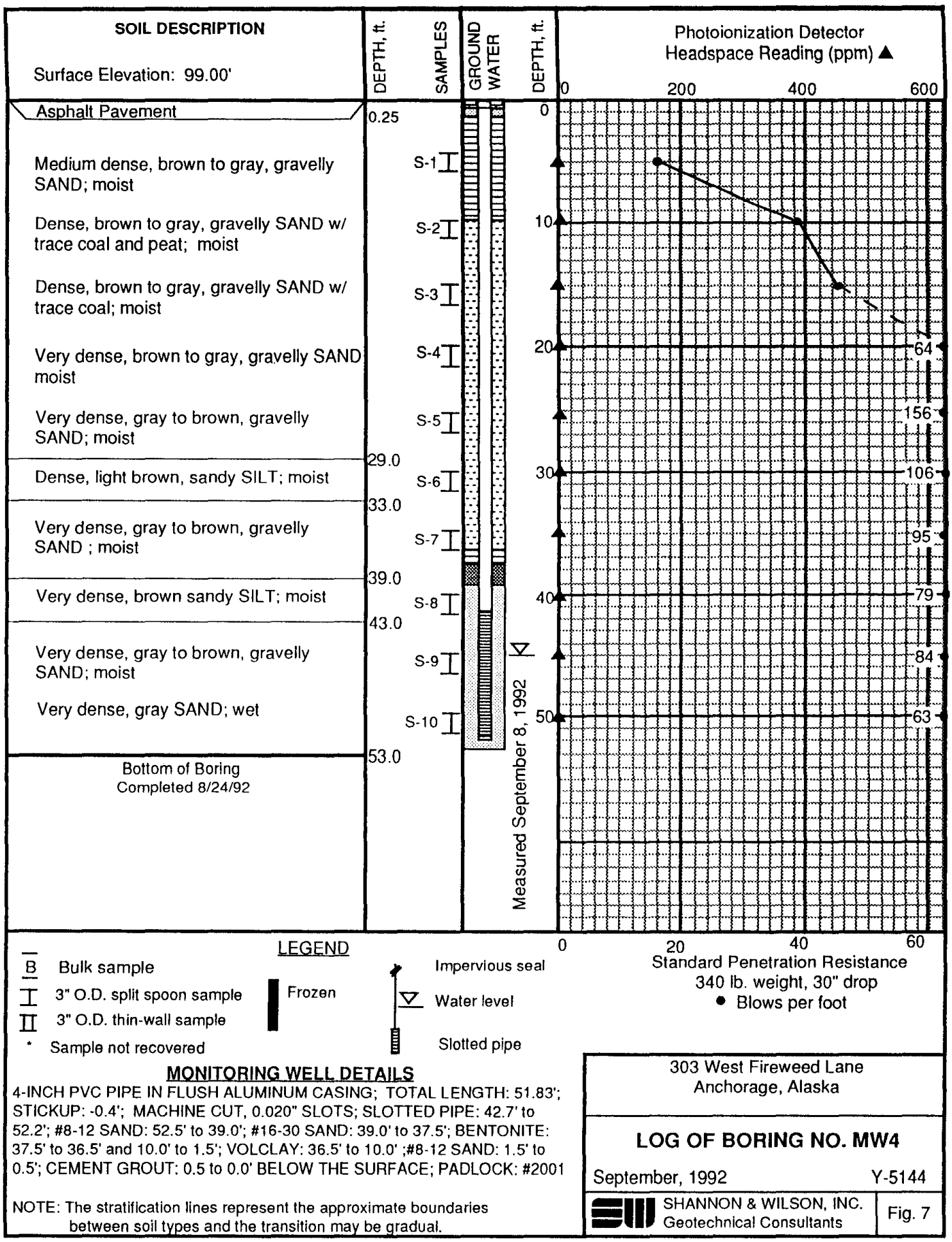
303 West Fireweed Lane
Anchorage, Alaska

LOG OF BORING NO. MW3

September, 1992 Y-5144

SHANNON & WILSON, INC.
Geotechnical Consultants

Fig. 6



MONITORING WELL DETAILS

4-INCH PVC PIPE IN FLUSH ALUMINUM CASING; TOTAL LENGTH: 51.83'; STICKUP: -0.4'; MACHINE CUT, 0.020" SLOTS; SLOTTED PIPE: 42.7' to 52.2'; #8-12 SAND: 52.5' to 39.0'; #16-30 SAND: 39.0' to 37.5'; BENTONITE: 37.5' to 36.5' and 10.0' to 1.5'; VOLCLAY: 36.5' to 10.0' ;#8-12 SAND: 1.5' to 0.5'; CEMENT GROUT: 0.5 to 0.0' BELOW THE SURFACE; PADLOCK: #2001

NOTE: The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.

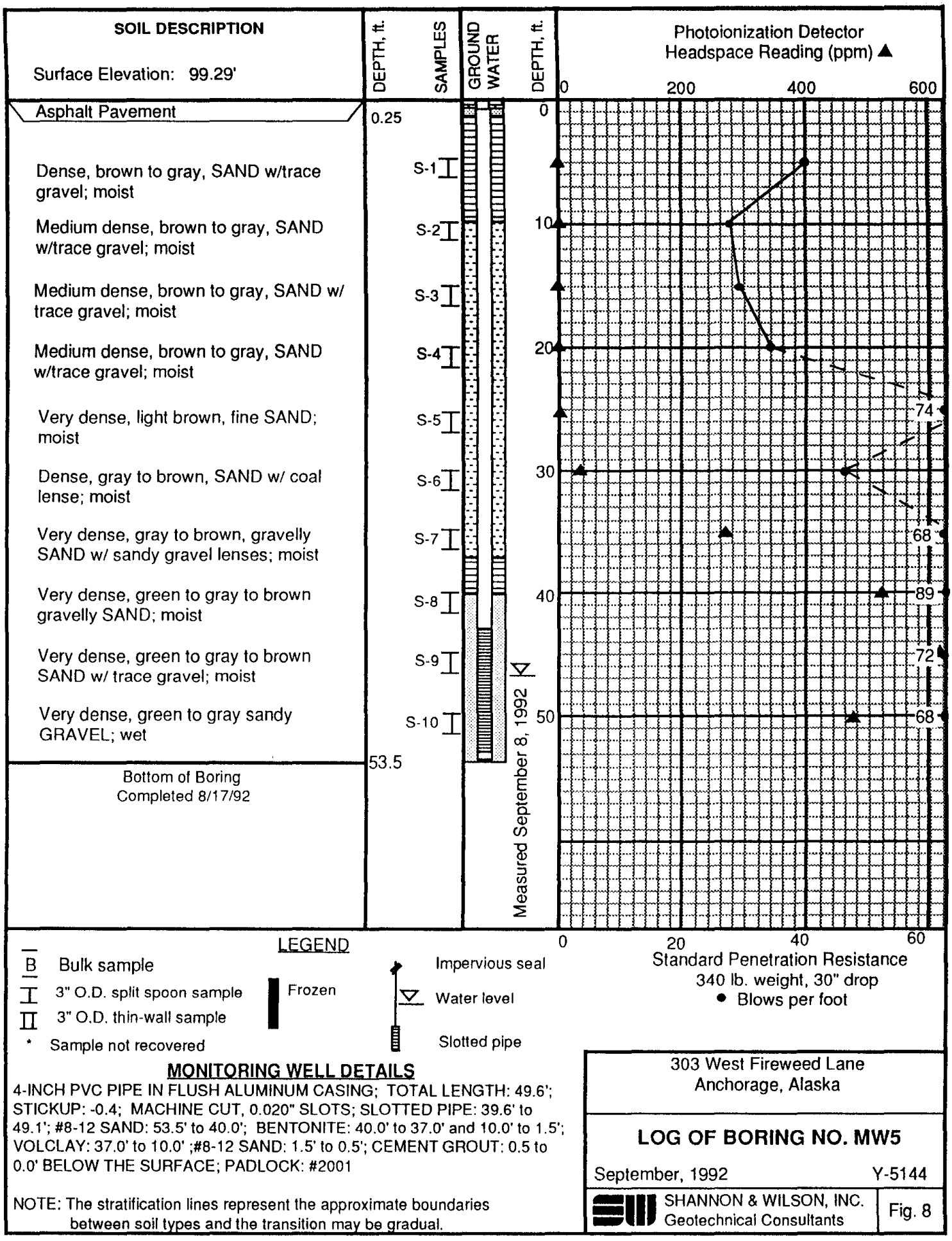
303 West Fireweed Lane
Anchorage, Alaska

LOG OF BORING NO. MW4

September, 1992 Y-5144

SHANNON & WILSON, INC.
Geotechnical Consultants

Fig. 7



MONITORING WELL DETAILS

4-INCH PVC PIPE IN FLUSH ALUMINUM CASING; TOTAL LENGTH: 49.6'; STICKUP: -0.4; MACHINE CUT, 0.020" SLOTS; SLOTTED PIPE: 39.6' to 49.1'; #8-12 SAND: 53.5' to 40.0'; BENTONITE: 40.0' to 37.0' and 10.0' to 1.5'; VOLCLAY: 37.0' to 10.0' ;#8-12 SAND: 1.5' to 0.5'; CEMENT GROUT: 0.5 to 0.0' BELOW THE SURFACE; PADLOCK: #2001

NOTE: The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.

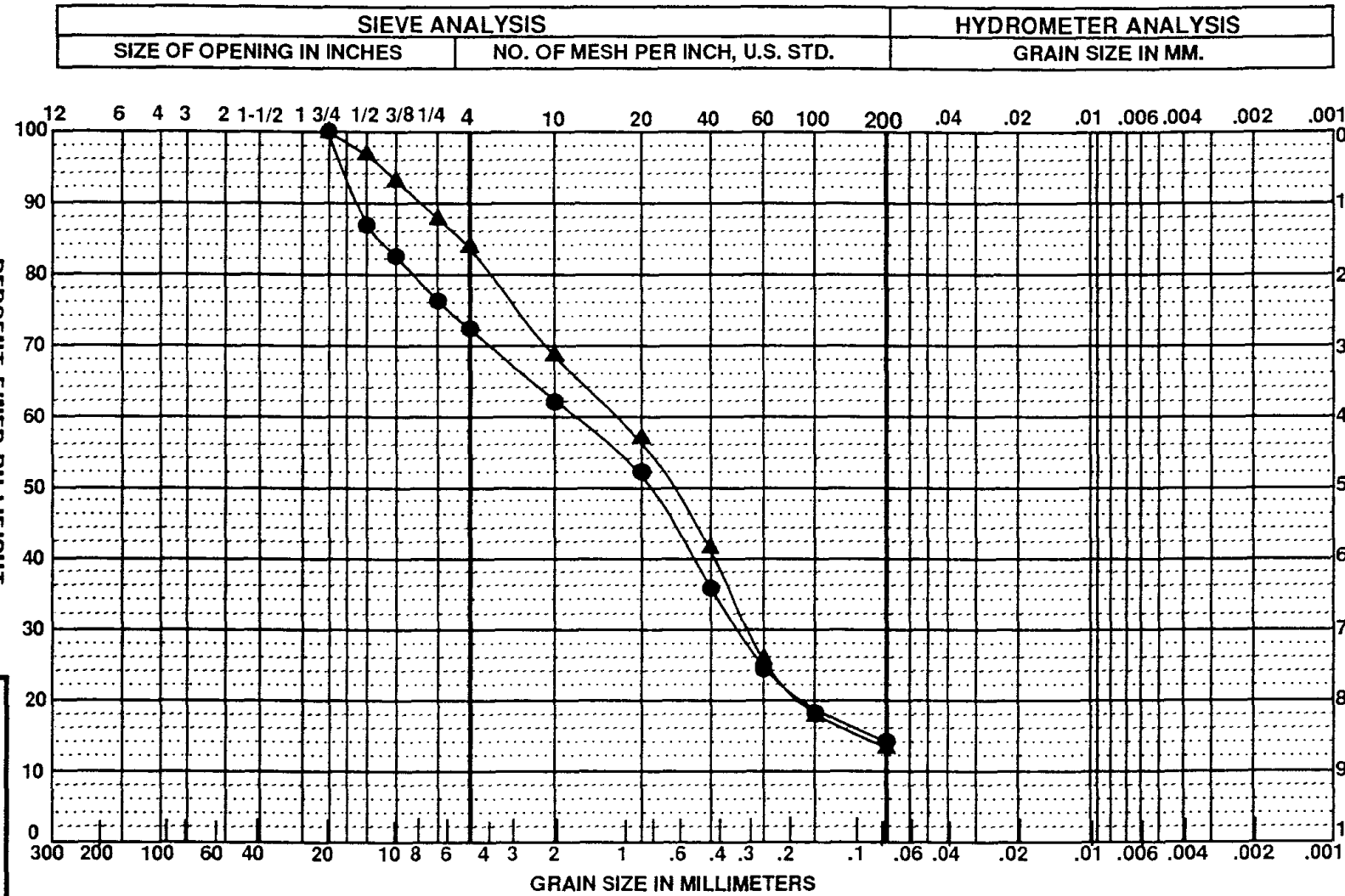
303 West Fireweed Lane
Anchorage, Alaska

LOG OF BORING NO. MW5

September, 1992 Y-5144

SHANNON & WILSON, INC.
Geotechnical Consultants

Fig. 8



SAMPLE NO.	DEPTH, FT.	U.S.C.	CLASSIFICATION	W.C.%	LL	PL	PI
B-1	Composite	SM	▲ Brown, silty, gravelly SAND	4.3			
B-2	Composite	SM	● Brown, silty, gravelly SAND	4.5			

GRAIN SIZE CLASSIFICATION

September, 1992

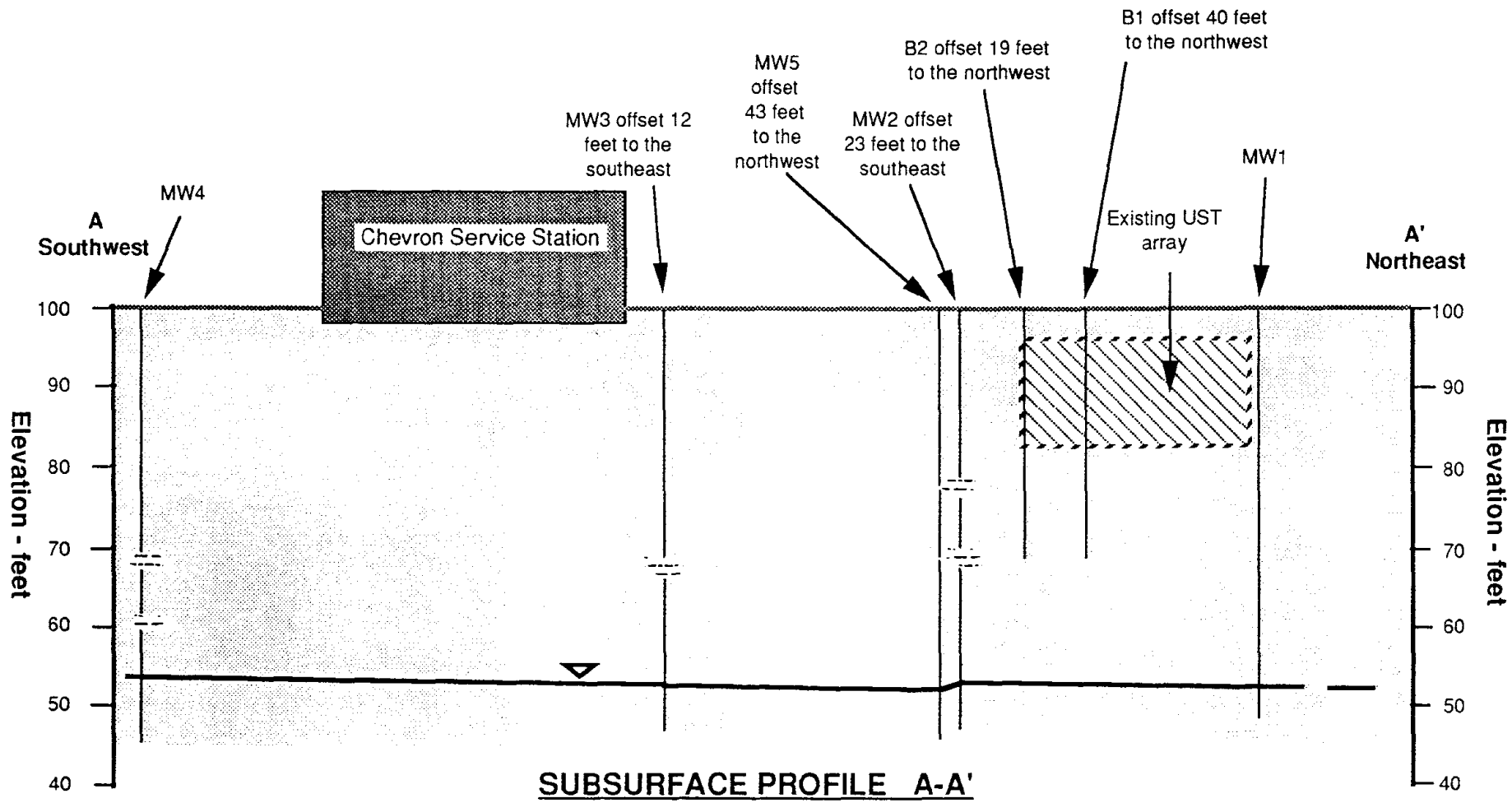
Y-5144

Fig. 9

SHANNON & WILSON, INC.
Geotechnical Consultants

303 West Fireweed Lane
Anchorage, Alaska

0 0051



SUBSURFACE PROFILE A-A'

LEGEND

Brown to gray, sandy SILT to SILT

Gray to brown, silty, sandy gravel and gravelly sand to silty sand

Water level in wells measured on 9/8/92; water level encountered in borings on 8/17-25/92

See Figure 1 for the location of the subsurface profile

NOTE: The stratification lines represent the approximate boundaries between soil types and the transition may be gradual

0 10 20 40

Horizontal Scale in Feet

303 West Fireweed Lane
Anchorage, Alaska

SUBSURFACE PROFILE A-A'

September, 1992 Y-5144

SHANNON & WILSON, INC.
Environmental & Geotechnical Consultants

FIG. 10

0052

APPENDIX A

RESULTS OF ANALYTICAL TESTING BY SUPERIOR PRECISION ANALYTICAL, INC. OF MARTINEZ, CALIFORNIA

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

SHANNON & WILSON, INC.
Attn: Curtis C. Conner

Project Y5143
Reported 26-August-1992

TOTAL PETROLEUM HYDROCARBONS

Sample preparation by solvent extraction. Chromatographic analysis by GC/FID (EPA SW-846 8100 Modified).

Chronology

Laboratory Number 86502

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
Y5144 B1S2	08/13/92	08/18/92	08/24/92	08/24/92	2	1
Y5144 B1S5	08/13/92	08/18/92	08/24/92	08/24/92	1	2
Y5144 B1S7	08/13/92	08/18/92	08/24/92	08/24/92	1	3
Y5144 B2S1	08/13/92	08/18/92	08/24/92	08/24/92	1	4
Y5144 B2S3	08/13/92	08/18/92	08/24/92	08/24/92	1	5
Y5144 B2S6	08/13/92	08/18/92	08/24/92	08/24/92	1	6

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

SHANNON & WILSON, INC.
Attn: Curtis C. Conner

Project Y5143
Reported 26-August-1992

TOTAL PETROLEUM HYDROCARBONS

Laboratory Number	Sample Identification	Matrix
86502- 1	Y5144 B1S2	Soil
86502- 2	Y5144 B1S5	Soil
86502- 3	Y5144 B1S7	Soil
86502- 4	Y5144 B2S1	Soil
86502- 5	Y5144 B2S3	Soil
86502- 6	Y5144 B2S6	Soil

RESULTS OF ANALYSIS

Laboratory Number:	86502- 1	86502- 2	86502- 3	86502- 4	86502- 5
Diesel:	560	ND<10	ND<10	ND<10	ND<10
Concentration:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Surrogate Recovery:	DO	97%	96%	99%	97%

Laboratory Number:	86502- 6
Diesel:	26*
Concentration:	mg/kg
Surrogate Recovery:	102%

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

0056

TOTAL PETROLEUM HYDROCARBONS
Quality Assurance and Control Data - Soil
Laboratory Number 86502

Compound	Method Blank (mg/kg)	PQL (mg/kg)	Average Spike Recovery (%)	Limits (%)	RPD (%)	Spike Level (mg/kg)
Diesel:	ND<10	10	104	75-125	2	200

* Diesel range concentration reported. A non-standard diesel pattern was observed in the chromatogram.

Definitions:
DO = DILUTED OUT.
ND = Not Detected
QL = Practical Quantitation Limit

RPD = Relative Percent Difference

QC File No. 86502

Veronica V Sanguinetti (for)
Senior Analyst

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

SHANNON & WILSON, INC.
Attn: Curtis C. Conner

Project Y5143
Reported 26-August-1992

VOLATILE PETROLEUM HYDROCARBONS

Gasoline range organics, quantified as all compounds appearing between C6 and C10, inclusive. Sample preparation by Purge and Trap (EPA SW-846 Method 5030). Chromatographic analysis by SW-846 Method 8015 Modified. Benzene, Toluene, Ethyl Benzene and Xylene analysis by GC/PID (EPA SW-846 Method 8020).

Chronology

Laboratory Number 86502

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
Y5144 B1S2	08/13/92	08/18/92	08/25/92	08/25/92	1	1
Y5144 B1S5	08/13/92	08/18/92	08/25/92	08/25/92	1	2
Y5144 B1S7	08/13/92	08/18/92	08/25/92	08/25/92	1	3
Y5144 B2S1	08/13/92	08/18/92	08/25/92	08/25/92	1	4
Y5144 B2S3	08/13/92	08/18/92	08/25/92	08/25/92	1	5
Y5144 B2S6	08/13/92	08/18/92	08/25/92	08/25/92	1	6

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

SHANNON & WILSON, INC.
Attn: Curtis C. Conner

Project Y5143
Reported 26-August-1992

VOLATILE PETROLEUM HYDROCARBONS

Laboratory Number	Sample Identification	Matrix
86502- 1	Y5144 B1S2	Soil
86502- 2	Y5144 B1S5	Soil
86502- 3	Y5144 B1S7	Soil
86502- 4	Y5144 B2S1	Soil
86502- 5	Y5144 B2S3	Soil
86502- 6	Y5144 B2S6	Soil

RESULTS OF ANALYSIS

Laboratory Number:	86502- 1	86502- 2	86502- 3	86502- 4	86502- 5
Gasoline:	6	ND<1	13	ND<1	3
Benzene:	ND<0.05	ND<0.05	ND<0.05	ND<0.05	ND<0.05
Toluene:	ND<0.05	ND<0.05	0.25	ND<0.05	ND<0.05
Ethyl Benzene:	ND<0.05	ND<0.05	0.24	ND<0.05	ND<0.05
Xylenes:	0.06	ND<0.05	1.7	0.09	0.16
Concentration:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Surrogate Recovery:	111%	105%	111%	104%	111%

Laboratory Number:	86502- 6
Gasoline:	1800
Benzene:	2.1
Toluene:	5.2
Ethyl Benzene:	13
Xylenes:	71
Concentration:	mg/kg
Surrogate Recovery:	119%

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

VOLATILE PETROLEUM HYDROCARBONS
Quality Assurance and Control Data - Soil
Laboratory Number 86502

Compound	Method Blank (mg/kg)	PQL (mg/kg)	Average Spike Recovery (%)	Limits (%)	RPD (%)	Spike Level (mg/kg)
Gasoline:	ND<1	1	93	75-125	5	0.4
Benzene:	ND<0.05	0.05	85	75-125	11	0.4
Toluene:	ND<0.05	0.05	100	75-125	11	0.4
Ethyl Benzene:	ND<0.05	0.05	103	75-125	10	0.4
Xylenes:	ND<0.05	0.05	101	75-125	11	0.4

Definitions:

ND = Not Detected
QL = Practical Quantitation Limit

RPD = Relative Percent Difference

QC File No. 86502

Filomina V Tamayo (per)
Senior Analyst

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

SHANNON & WILSON, INC.	Project Y5143
Attn: Curtis C. Conner	Reported 26-August-1992

TOTAL PETROLEUM HYDROCARBONS (EPA METHOD 418.1)

Sample preparation by Freon extraction, and analyzed by infrared spectroscopy. Soil samples prepared by microextraction with Freon (EPA Method 418.1 Modified).

Chronology — Laboratory Number 86502

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
Y5144 B1S2	08/13/92	08/18/92	08/25/92	08/25/92		1
Y5144 B1S5	08/13/92	08/18/92	08/25/92	08/25/92		2
Y5144 B1S7	08/13/92	08/18/92	08/25/92	08/25/92		3
Y5144 B2S1	08/13/92	08/18/92	08/25/92	08/25/92		4
Y5144 B2S3	08/13/92	08/18/92	08/25/92	08/25/92		5
Y5144 B2S6	08/13/92	08/18/92	08/25/92	08/25/92		6

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

SHANNON & WILSON, INC.
Attn: Curtis C. Conner

Project Y5143
Reported 26-August-1992

TOTAL PETROLEUM HYDROCARBONS (EPA METHOD 418.1)

Laboratory Number	Sample Identification	Matrix
86502- 1	Y5144 B1S2	Soil
86502- 2	Y5144 B1S5	Soil
86502- 3	Y5144 B1S7	Soil
86502- 4	Y5144 B2S1	Soil
86502- 5	Y5144 B2S3	Soil
86502- 6	Y5144 B2S6	Soil

RESULTS OF ANALYSIS

Laboratory Number:	86502- 1	86502- 2	86502- 3	86502- 4	86502- 5
PETROLEUM HYDROCARBONS:	570	ND<25	ND<25	85	ND<25
Concentration:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

Laboratory Number:	86502- 6
PETROLEUM HYDROCARBONS:	62
Concentration:	mg/kg

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

TOTAL PETROLEUM HYDROCARBONS (EPA METHOD 418.1)
Quality Assurance and Control Data - Soil
Laboratory Number 86502

ompound	Method Blank (mg/kg)	PQL (mg/kg)	Average Spike Recovery (%)	Limits (%)	RPD (%)	Spike Level (mg/kg)
ETROLEUM HYDROCARBONS:	ND<25	25	117%	75-125	5	100

efinitions:

ND = Not Detected
PQL = Practical Quantitation Limit

RPD = Relative Percent Difference

C File No. 86502

Senior Analyst

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

Shannon & Wilson, Inc.
Attn: TIM TERRY

Project Y-5144
Reported 28-August-1992

TOTAL PETROLEUM HYDROCARBONS

Sample preparation by solvent extraction. Chromatographic analysis by GC/FID (EPA SW-846 Method 8100 modified).

Chronology

Laboratory Number 86521

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
MW-1, S-2	08/18/92	08/21/92	08/27/92	08/27/92	1	1
MW-1, S-6	08/18/92	08/21/92	08/27/92	08/27/92	1	2
MW-1, S-9	08/18/92	08/21/92	08/27/92	08/27/92	1	3
MW-5, S-2	08/17/92	08/21/92	08/27/92	08/27/92	1	4
MW-5, S-7	08/17/92	08/21/92	08/27/92	08/27/92	1	5
MW-5, S-10	08/17/92	08/21/92	08/27/92	08/27/92	1	6

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

Shannon & Wilson, Inc.
Attn: TIM TERRY

Project Y-5144
Reported 28-August-1992

TOTAL PETROLEUM HYDROCARBONS

Laboratory Number	Sample Identification	Matrix
86521- 1	MW-1, S-2	Soil
86521- 2	MW-1, S-6	Soil
86521- 3	MW-1, S-9	Soil
86521- 4	MW-5, S-2	Soil
86521- 5	MW-5, S-7	Soil
86521- 6	MW-5, S-10	Soil

RESULTS OF ANALYSIS

Laboratory Number:	86521- 1	86521- 2	86521- 3	86521- 4	86521- 5
Diesel:	25*	17**	ND<10	ND<10	44
Concentration:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Surrogate Recovery:	100%	104%	97%	103%	95%

Laboratory Number:	86521- 6
Diesel:	ND<10
Concentration:	mg/kg
Surrogate Recovery:	140%

* Diesel range concentration. The pattern observed in the chromatogram was not typical of diesel and showed the presence of hydocarbons heavier than diesel #2.

** Diesel range concentration. The pattern observed in the chromatogram was not typical of diesel and showed the presence of hydrocarbons lighter than diesel.

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

TOTAL PETROLEUM HYDROCARBONS
Quality Assurance and Control Data - Soil
Laboratory Number 86521

Compound	Method Blank (mg/kg)	PQL (mg/kg)	Average Spike Recovery (%)	Limits (%)	RPD (%)	Spike Level (mg/kg)
Diesel:	ND<10	10	104	75-125	2	200

Definitions:

ND = Not Detected
PQL = Practical Quantitation Limit

RPD = Relative Percent Difference

QC File No. 86521

Charles E. Green
Senior Analyst

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

Shannon & Wilson, Inc.
Attn: TIM TERRY

Project Y-5144
Reported 28-August-1992

VOLATILE PETROLEUM HYDROCARBONS

Gasoline range organics, quantified as all compounds appearing between C6 and C10, inclusive. Sample preparation by Purge and Trap (EPA SW-846 Method 5030). Chromatographic analysis by SW-846 Method 8015 Modified. Benzene, Toluene, Ethyl Benzene and Xylene analysis by GC/PID (EPA SW-846 Method 8020).

Chronology

Laboratory Number 86521

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
MW-1, S-2	08/18/92	08/21/92	08/27/92	08/27/92	1	1
MW-1, S-6	08/18/92	08/21/92	08/27/92	08/28/92	4	2
MW-1, S-9	08/18/92	08/21/92	08/27/92	08/27/92	1	3
MW-5, S-2	08/17/92	08/21/92	08/27/92	08/27/92	1	4
MW-5, S-7	08/17/92	08/21/92	08/27/92	08/27/92	1	5
MW-5, S-10	08/17/92	08/21/92	08/27/92	08/27/92	1	6

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

Shannon & Wilson, Inc.
Attn: TIM TERRY

Project Y-5144
Reported 28-August-1992

VOLATILE PETROLEUM HYDROCARBONS

Laboratory Number	Sample Identification	Matrix
86521- 1	MW-1, S-2	Soil
86521- 2	MW-1, S-6	Soil
86521- 3	MW-1, S-9	Soil
86521- 4	MW-5, S-2	Soil
86521- 5	MW-5, S-7	Soil
86521- 6	MW-5, S-10	Soil

RESULTS OF ANALYSIS

Laboratory Number:	86521- 1	86521- 2	86521- 3	86521- 4	86521- 5
Gasoline:	ND<1	77	3*	ND<1	7*
Benzene:	ND<0.05	0.22	ND<0.05	ND<0.05	ND<0.05
Toluene:	ND<0.05	1.6	ND<0.05	ND<0.05	ND<0.05
Ethyl Benzene:	ND<0.05	0.97	ND<0.05	ND<0.05	ND<0.05
Xylenes:	ND<0.05	7.7	0.16	ND<0.05	ND<0.05
Concentration:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Surrogate Recovery:	87%	114%	99%	88%	103%

Laboratory Number:	86521- 6
Gasoline:	14*
Benzene:	ND<0.05
Toluene:	ND<0.05
Ethyl Benzene:	ND<0.05
Xylenes:	0.07
Concentration:	mg/kg
Surrogate Recovery:	108%

* Gasoline range concentration. A non-standard gasoline pattern was observed in the chromatogram.

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

VOLATILE PETROLEUM HYDROCARBONS
Quality Assurance and Control Data - Soil
Laboratory Number 86521

Compound	Method Blank (mg/kg)	PQL (mg/kg)	Average Spike Recovery (%)	Limits (%)	RPD (%)	Spike Level (mg/kg)
Gasoline:	ND<1	1	101%	75-125	0%	0.4
Benzene:	ND<0.05	0.05	96%	75-125	9%	0.4
Toluene:	ND<0.05	0.05	103%	75-125	8%	0.4
Ethyl Benzene:	ND<0.05	0.05	104%	75-125	8%	0.4
Xylenes:	ND<0.05	0.05	102%	75-125	8%	1.2

Definitions:

ND = Not Detected
PQL = Practical Quantitation Limit

RPD = Relative Percent Difference

QC File No. 86521

Charles Green
Senior Analyst

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

Shannon & Wilson, Inc.
Attn: TIM TERRY

Project Y-5144
Reported 28-August-1992

TOTAL PETROLEUM HYDROCARBONS (EPA METHOD 418.1)

Sample preparation by Freon extraction, and analyzed by infrared spectroscopy. Soil samples prepared by microextraction with Freon (EPA Method 418.1 Modified).

Chronology

Laboratory Number 86521

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
MW-1, S-2	08/18/92	08/21/92	08/27/92	08/27/92	1	1
MW-1, S-6	08/18/92	08/21/92	08/27/92	08/27/92	1	2
MW-1, S-9	08/18/92	08/21/92	08/27/92	08/27/92	1	3
MW-5, S-2	08/17/92	08/21/92	08/27/92	08/27/92	1	4
MW-5, S-7	08/17/92	08/21/92	08/27/92	08/27/92	1	5
MW-5, S-10	08/17/92	08/21/92	08/27/92	08/27/92	1	6

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

Shannon & Wilson, Inc.
Attn: TIM TERRY

Project Y-5144
Reported 28-August-1992

TOTAL PETROLEUM HYDROCARBONS (EPA METHOD 418.1)

Laboratory Number	Sample Identification	Matrix
86521- 1	MW-1, S-2	Soil
86521- 2	MW-1, S-6	Soil
86521- 3	MW-1, S-9	Soil
86521- 4	MW-5, S-2	Soil
86521- 5	MW-5, S-7	Soil
86521- 6	MW-5, S-10	Soil

RESULTS OF ANALYSIS

Laboratory Number:	86521- 1	86521- 2	86521- 3	86521- 4	86521- 5
PETROLEUM HYDROCARBONS:	300	ND<25	ND<25	ND<25	72
Concentration:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

Laboratory Number:	86521- 6
PETROLEUM HYDROCARBONS:	ND<25
Concentration:	mg/kg

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

TOTAL PETROLEUM HYDROCARBONS (EPA METHOD 418.1)
Quality Assurance and Control Data - Soil
Laboratory Number 86521

ompound	Method Blank (mg/kg)	PQL (mg/kg)	Average Spike Recovery (%)	Limits (%)	RPD (%)	Spike Level (mg/kg)
ETROLEUM HYDROCARBONS:	ND<25	25	117%	75-125	5%	100

Definitions:

D = Not Detected
QL = Practical Quantitation Limit

RPD = Relative Percent Difference

C File No. 86521

Charles Green
Senior Analyst

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

Shannon & Wilson, Inc.
Attn: TIM TERRY

Project Y-5144
Reported 09-September-1992

VOLATILE PETROLEUM HYDROCARBONS

Gasoline range organics, quantified as all compounds appearing between C6 and C10, inclusive. Sample preparation by Purge and Trap (EPA SW-846 Method 5030). Chromatographic analysis by SW-846 Method 8015 Modified. Benzene, Toluene, Ethyl Benzene and Xylene analysis by GC/PID (EPA SW-846 Method 8020).

Chronology — Laboratory Number 86602

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
MW5W1	08/27/92	09/01/92		09/08/92		1
MW1W1	08/27/92	09/01/92		09/09/92		2
MW4W1	08/27/92	09/01/92		09/09/92		3
MW2W1	08/27/92	09/01/92		09/09/92		4
MW2W1-DUP	08/27/92	09/01/92		09/09/92		5
MW3W1	08/27/92	09/01/92		09/09/92		6
MW1AW1	08/27/92	09/01/92		09/09/92		7
TB-LB	08/27/92	09/01/92		09/09/92		8

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

Shannon & Wilson, Inc.
Attn: TIM TERRY

Project Y-5144
Reported 09-September-1992

VOLATILE PETROLEUM HYDROCARBONS

Laboratory Number	Sample Identification	Matrix
86602- 1	MW5W1	Water
86602- 2	MW1W1	Water
86602- 3	MW4W1	Water
86602- 4	MW2W1	Water
86602- 5	MW2W1-DUP	Water
86602- 6	MW3W1	Water
86602- 7	MW1AW1	Water
86602- 8	TB-LB	Water

RESULTS OF ANALYSIS

Laboratory Number:	86602- 1	86602- 2	86602- 3	86602- 4	86602- 5
Gasoline:	38000	1400	ND<100	19000	21000
Benzene:	1500	490	ND<1	3100	3400
Toluene:	4200	94	ND<1	4500	4900
Ethyl Benzene:	800	22	ND<1	470	510
Xylenes:	3700	98	ND<1	2200	2400
Concentration:	ug/L	ug/L	ug/L	ug/L	ug/L
Surrogate Recovery:	99%	98%	81%	96%	97%

Laboratory Number:	86602- 6	86602- 7	86602- 8
Gasoline:	ND<100	NA	NA
Benzene:	ND<1	44	ND<1
Toluene:	ND<1	41	ND<1
Ethyl Benzene:	ND<1	43	ND<1
Xylenes:	ND<1	87	ND<1
Concentration:	ug/L	ug/L	ug/L
Surrogate Recovery:	88%	104%	84%

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

VOLATILE PETROLEUM HYDROCARBONS
Quality Assurance and Control Data - Water
Laboratory Number 86602

ompound	Method Blank (ug/L)	PQL (ug/L)	Average Spike Recovery (%)	Limits (%)	RPD (%)	Spike Level (ng)
asoline:	ND<100	100	94	75-125	4	200 ng
Benzene:	ND<1	1	100	75-125	3	200 ng
Toluene:	ND<1	1	99	75-125	3	200 ng
thyl Benzene:	ND<1	1	100	75-125	3	200 ng
Xylenes:	ND<1	1	100	75-125	3	200 ng

Definitions:

D = Not Detected
PQL = Practical Quantitation Limit

RPD = Relative Percent Difference

C File No. 86602

Robin Faulkner
Senior Analyst

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

Shannon & Wilson, Inc.
Attn: TIM TERRY

Project Y-5144
Reported 09-September-1992

TOTAL PETROLEUM HYDROCARBONS (EPA METHOD 418.1)

Sample preparation by Freon extraction, and analyzed by infrared spectroscopy. Soil samples prepared by microextraction with Freon (EPA Method 418.1 Modified).

Chronology

Laboratory Number 86602

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
MW5W1	08/27/92	09/01/92	09/09/92	09/09/92		1
MW1W1	08/27/92	09/01/92	09/09/92	09/09/92		2
MW4W1	08/27/92	09/01/92	09/09/92	09/09/92		3
MW2W1	08/27/92	09/01/92	09/09/92	09/09/92		4
MW2W1-DUP	08/27/92	09/01/92	09/09/92	09/09/92		5
MW3W1	08/27/92	09/01/92	09/09/92	09/09/92		6

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

Shannon & Wilson, Inc.
Attn: TIM TERRY

Project Y-5144
Reported 09-September-1992

TOTAL PETROLEUM HYDROCARBONS (EPA METHOD 418.1)

Laboratory Number	Sample Identification	Matrix
86602- 1	MW5W1	Water
86602- 2	MW1W1	Water
86602- 3	MW4W1	Water
86602- 4	MW2W1	Water
86602- 5	MW2W1-DUP	Water
86602- 6	MW3W1	Water

RESULTS OF ANALYSIS

Laboratory Number:	86602- 1	86602- 2	86602- 3	86602- 4	86602- 5
PETROLEUM HYDROCARBONS:	2	ND<1	ND<1	2	2
Concentration:	mg/L	mg/L	mg/L	mg/L	mg/L

Laboratory Number:	86602- 6
PETROLEUM HYDROCARBONS:	ND<1
Concentration:	mg/L

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

n 0077

TOTAL PETROLEUM HYDROCARBONS (EPA METHOD 418.1)
Quality Assurance and Control Data - Water
Laboratory Number 86602

Compound	Method Blank (mg/L)	PQL (mg/L)	Average Spike Recovery (%)	Limits (%)	RPD (%)	Spike Level (mg/L)
'ETROLEUM HYDROCARBONS:	ND<1	1	102	75-125	6	100

efinitions:

ND = Not Detected
QL = Practical Quantitation Limit

RPD = Relative Percent Difference

QC File No. 86602

Robin Paulson
Senior Analyst

Fax copy of Lab Rep at CC to Chevron Contact: ☐ No

Chain-of-Custody-Record

Chevron U.S.A. Inc.
P.O. BOX 5004
San Ramon, CA 94583
FAX (415)842-9591

Chevron Facility Number: 9-6097
Facility Address:
Consultant Project Number: Y5143
Consultant Name: Shannon & Wilson.
Address:
Project Contact (Name):
(Phone): (Fax Number):

Chevron Contact (Name):
(Phone):
Laboratory Name: Superior Analytical, Inc
Laboratory Release Number: 7899200
Samples Collected by (Name):
Collection Date:
Signature:

8oz Amber Glass

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil A = Air W = Water C = Charcoal	Type G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iced (Yes or No)	BTEX + TPH GAS (8020 + 8015)	TPH Diesel (8013) (8/00)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd,Cr,Pb,Zn,Ni (ICAP or AA)	TPH-418.1	Gasoline Range Orig. 5030/8015	Diesel Range 3510/8015	BTEX - 8020		Remarks
B154 B152	15	1			8/13 1245											✓	✓	✓	✓		Soil
" B155	16	1			8/13 1335											✓	✓	✓	✓		
" B157	17	1			8/13 1400											✓	✓	✓	✓		
" B251	18	1			8/13 1425											✓	✓	✓	✓		
" B253	19	1			8/13 1445											✓	✓	✓	✓		
" B256	20	1			8/13 1520											✓	✓	✓	✓		

Please initial: BW
Samples Stored in Ice. ✓
Appropriate containers. ✓
Samples preserved. ✓
VOA's without headspace. ✓
Comments:

1078

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Curtis C. Conner	S&W	8/17 930			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time
			Brenda L. Oliver SAC		8/18/92

Turn Around Time (Circle Choice)
24 Hrs.
48 Hrs.
(5 Days)
10 Days
As Contracted

Fax copy of Lab Report and COC to Chevron Contact: ☒ Yes ☐ No 13428 **Chain-of-Custody-Record**

Chevron U.S.A. Inc.
P.O. BOX 5004
San Ramon, CA 94583
FAX (415)842-9591

Chevron Facility Number 9-6097
Facility Address 303 W. Fireweed, Anchorage AK
Consultant Project Number Y-5144
Consultant Name Shannon & Wilson
Address 5430 Fairbanks St. Suite 3, Anchorage AK
Project Contact (Name) Tim Terry
(Phone) (907) 561-2120 (Fax Number) (907) 561-4483

Chevron Contact (Name) Phil Briggs
(Phone) (510) 842-8924
Laboratory Name Superior Analytical, Inc
Laboratory Release Number 7899200
Samples Collected by (Name) Jim Zschau
Collection Date 8-24-92 & 8-25-92
Signature James A Zschau

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iced (Yes or No)	BTEX + TPH GAS (8020 + 8015)	TPH Diesel (8015) (8/00)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd,Cr,Pb,Zn,Ni (ICAP or AA)	BTEX 8020	GRO 5030/8015	DRO 3550/8100	TPH 3540/418.1	Remarks
MW2S2	1	1	S	G	8-24 1740	COLD	Yes									✓	✓	✓	✓	
MW2S7	2	1	S	G	8-24 1840											✓	✓	✓	✓	
MW2S11	3	1	S	G	8-25 1000											✓	✓	✓	✓	
MW4S2	4	1	S	G	8-24 0930											✓	✓	✓	✓	
MW4S6	5	1	S	G	8-24 1025											✓	✓	✓	✓	
MW4S10	6	1	S	G	8-24 1140											✓	✓	✓	✓	
MW3S2	7	1	S	G	8-25 1335											✓	✓	✓	✓	
MW3S6	8	1	S	G	8-25 1430											✓	✓	✓	✓	
MW3S11	9	1	S	G	8-25 1555											✓	✓	✓	✓	

Please initial:
Samples Stored in ice
Appropriate containers
Samples preserved
VOA's without headspace?
Comments:

6203

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
James A Zschau	Shannon & Wilson	8-26-92/0900			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received for Laboratory By (Signature)	Date/Time	
			Nancy A Nelson	8/27/92 9:30	

Turn Around Time (Circle Choice)
24 Hrs.
48 Hrs.
5 Days
10 Days
As Contracted

Fax copy of Lab Report and COC to Chevron Contact: ☐ Y ☐ No

Chain-of-Custody-Reco

8622

Chevron U.S.A. Inc.
P.O. BOX 5004
San Ramon, CA 94583
FAX (415)842-9591

Chevron Facility Number: 9-6097
Facility Address: 303 W. Fireweed, Ancorage Alaska
Consultant Project Number: Y-5144
Consultant Name: Shannon & Wilson, Inc.
Address: 5430 Fairbanks St., Suite 3, Ancorage Alaska
Project Contact (Name): Tim Terry
(Phone) (907) 561-2120 (Fax Number) (907) 561-4483

Chevron Contact (Name): Mr. Phil Briggs
(Phone): (510) 842-9500
Laboratory Name: Superior Analytical, Inc
Laboratory Release Number: 7899200
Samples Collected by (Name): Jim Zschau
Collection Date: 8-17-92, 8-18-92
Signature: James G. Zschau

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iced (Yes or No)	Analyses To Be Performed: BTEX + TPH GAS (8020 + 8015) / 5030 / 8015	TPH Diesel (8015) (S/W)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd,Cr,Pb,Zn,Ni (ICAP or AA)	TPH EPA 3540/418.1				Remarks
MW-1, S-2	-1	1	S	D	8-18-92 0825	COLD	Yes	X	X							X				Monitoring well MW-1
MW-1, S-6	-2	1	S	D	8-18-92 0910	↓	↓	X	X							X				" " MW-1
MW-1, S-9	-3	1	S	D	8-18-92 1000			X	X							X				" " MW-1
MW-5, S-2	-4	1	S	D	8-17-92 0854			X	X							X				" " MW-5
MW-5, S-7	-5	1	S	D	8-17-92 0955			X	X							X				" " MW-5
MW-5, S-10	-6	1	S	D	8-17-92 1100			X	X							X				" " MW-5

Please initial:
Samples Stored in ice.
Appropriate containers.
Samples preserved.
VOA's without headspace.
Comments:

3080

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
David Markert	Shannon Wilson	8/20/92 15:15			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time 8-21-92

Turn Around Time (Circle Choice)
24 Hrs.
48 Hrs.
5 Days
10 Days
As Contracted

Fax copy of Lab Report and COC to Chevron Contact: ☐ No

Chain-of-Custody-Recor

Chevron U.S.A. Inc.
P.O. BOX 5004
San Ramon, CA 94583
FAX (415)842-9591

Chevron Facility Number: 9-6097
Facility Address: 303 W. Fireweed, Anchorage AK
Consultant Project Number: Y-5144
Consultant Name: Shannon & Wilson
Address: 5430 Fairbanks St, Suite 3
Project Contact (Name): Tim Terry
(Phone) (907) 561-2120 (Fax Number) (907) 561-4483

Chevron Contact (Name): Phil Briggs
(Phone): (510) 842-9500
Laboratory Name: Superior Analytical, Inc
Laboratory Release Number: 7899200
Samples Collected by (Name): Jim Zschau S&W
Collection Date: 8-27-92 through 8-29-92
Signature: James A Zschau

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iced (Yes or No)	BTEX + TPH GAS (8020 + 8015)	TPH Diesel (8015) (S/UU)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd,Cr,Pb,Zn,Ni (ICAP or AA)	BTEX 602	GRO 5030/8015	TPH 3550/5520/418.1			Remarks
MW5W1	1	5	W		8-27-92 1400	4 5ml HCL in VOA's COLD	Yes									✓	✓	✓			BTEX 602 or 20
MW1W1	2	5	↓		8-28-92 1130	↓	↓									✓	✓	✓			BTEX - (2) VOA's
MW4W1	3	5			8-29-92 0900											✓	✓	✓			GRO - (2) VOA's
MW2W1	4	5			8-29-92 1000											✓	✓	✓			TPH - (1) 1 Liter
MW2W1Dup	5	5			8-29-92 1000											✓	✓	✓			
MW3W1	6	5			8-29-92 1100											✓	✓	✓			
MW1AW1	7	2			8-24-92 1200											✓					
Trip Blank	8	2	↓		8-29-92 1300	↓	↓														

Please initial: ✓
Samples Stored in Ice — SC
Appropriate containers — SC
Samples preserved — SC
VOA's without headspace — SC
Comments:

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
James A Zschau	S&W	8-31-92/0800			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time 9/1/92 09:00

Turn Around Time (Circle Choice)
24 Hrs.
48 Hrs.
(5 Days)
10 Days
As Contracted

CONSULTANT
William L. Shannon, P.E.

0 00082

Y-5144-2

SHANNON & WILSON, INC.
Geotechnical Consultants
Engineering and Applied Geosciences

Over 35 Years of Excellence

5430 Fairbanks Street, Suite 3 • Anchorage, Alaska 99518 • Phone (907) 561-2120 • Fax: (907) 561-4483

October 12, 1992

Alaska Department of Environmental Conservation
3601 C Street, Suite 316
Anchorage, Alaska 99503

Attn: Mr. Robert Weimer

RE: DISPOSAL OF WASTE SOILS FROM CHEVRON STATION, 303 WEST FIREWEED, ANCHORAGE, ALASKA

Pursuant to discussions with Chevron USA, Shannon & Wilson has been requested to coordinate disposal of waste soils which were excavated during September, 1992 from an underground storage tank project at 303 West Fireweed, Anchorage, Alaska. These soils have been transported and stockpiled in Alaska Soils Recycling's (ASR) long-term storage facility, as per our letter to ADEC on September 4, 1992. This letter presents the information requested by the ADEC for authorization for disposal of the stockpiled soils at Alaska Soils Recycling.

A total of approximately 2650 tons of waste soils were received by ASR and a total of eight samples were selected and analyzed to classify these waste soils. The soils were field screened by our field representative and the soils with the highest reading on the PID reading were selected for analysis. The headspace soil samples were placed in clear glass jars with plastic lids while the analytical soil from each sampling area was placed in separate 250 ml glass bottles with teflon-lined caps. The samples with the highest PID headspace readings were submitted for analytical testing to characterize the waste soils. The approximate locations of the soil samples are shown on Figure 1. Sampling was accomplished by an experienced geologist using Level D personnel protection.

The contaminant concentrations in the waste soils were determined by analytical testing of the soil sample with the highest PID headspace readings, designated Samples S7, S16, S17, S,18, S19, S20, S36 and S70. The sample locations and descriptions are presented in Table 1 and Figure 1. A summary of the results is presented in Table 2 and the laboratory reports are provided in Appendix A. The samples were analyzed to characterize the excavated soils removed from the UST excavation. The samples were submitted for analyses because their companion headspace soil samples had the highest PID reading for the contaminated and potentially contaminated soils.

The level of diesel range organics (DRO) ranged from a high concentration in S7 of 1810 ppm to non-detectable levels in S17 and S18. Halogenated volatile organics ranged from S7 of 0.039 ppm to non-detectable levels in the remaining samples. Sample S19 had the highest concentration of gasoline range organics (GRO) of 1500 ppm with non-detectable levels in Samples S17 and S18. Sample S19 had the highest range of total BTEX of 293.1 ppm with non-detectable levels of total BTEX samples S17 and S18. Sample S7 had a non-detectable concentration of TCLP Metals and the highest range of total metals, 3.4 ppm arsenic, 20 ppm chromium, 76 ppm lead.

With this letter, Shannon and Wilson would like to petition ADEC for approval for Anchorage Soils Recycling to process these soils. The ADEC can indicate approval for processing at ASR by signing the line provided at the bottom of this letter. Please feel free to call the undersigned with any questions or comments on the contents of this letter or the attached laboratory test results.

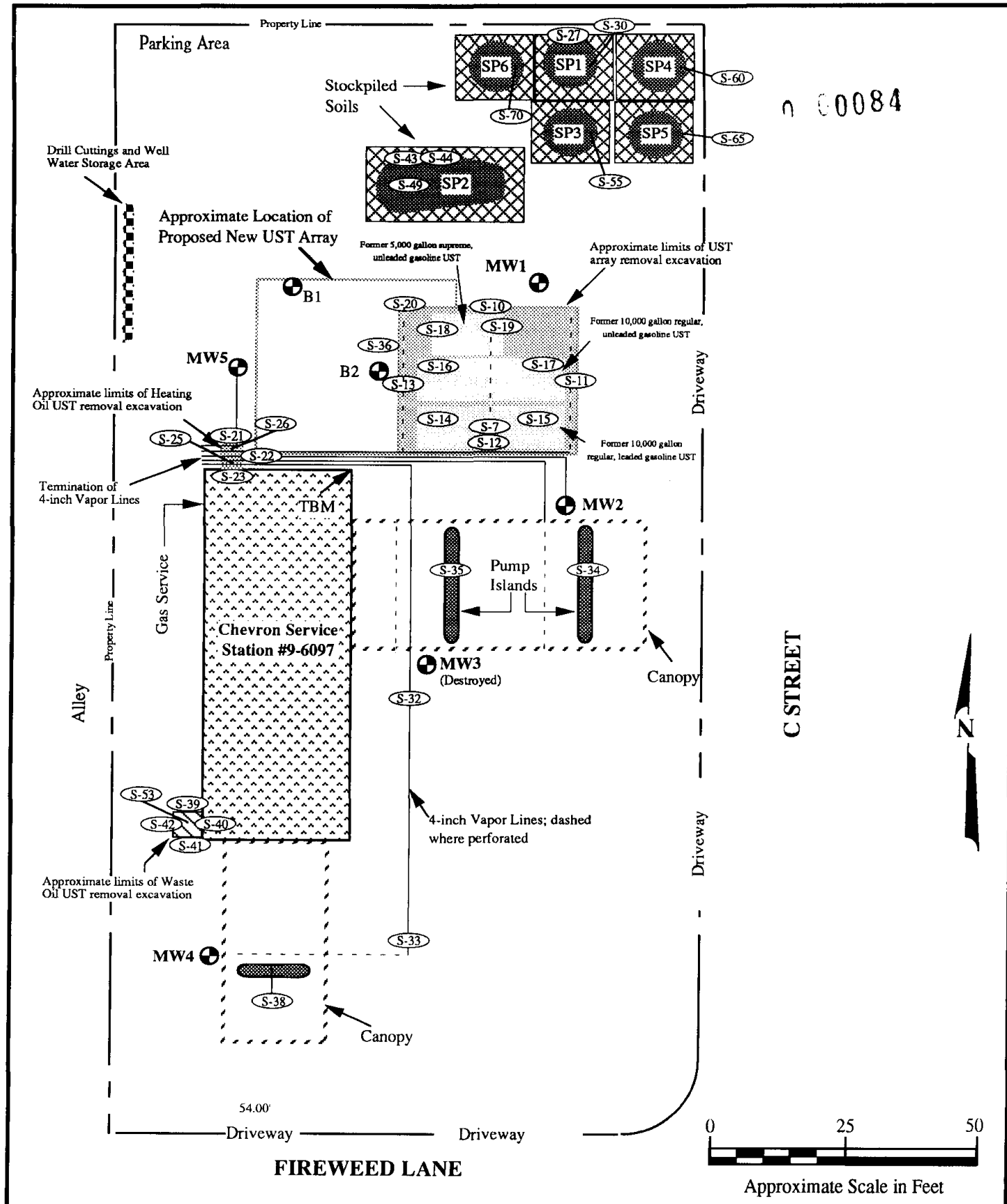
Sincerely,

SHANNON & WILSON, INC.

Timothy M. Terry
Associate Engineering Geologist

Enclosures: Figure 1; Tables 1 and 2; Appendix A

Treatment of Soils at ASR approved by: _____
ADEC Representative



n 00084

Soil stockpiles from excavations

S-7 Soil samples collected and submitted for analytical testing

MW5 Number and location of boring/monitoring well by Shannon & Wilson, September, 1992

TBM Temporary bench mark with assumed elevation of 100.00 feet

303 West Fireweed Lane
Anchorage, Alaska

SITE PLAN

October, 1992 Y-5144-2

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 1

TABLE 1 - SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location (See Figure 1 and Table 2)	Depth (Ft)	Sample Classification
S1	9/10/92	Underneath center of east pump island (P.I.)	1.5	Brown, silty, gravelly SAND
S2	9/10/92	Underneath T connection branching to east P.I.	1.5	Brown, silty, gravelly SAND
S3	9/10/92	Underneath center of west pump island	1.5	Brown, silty, gravelly SAND
S4	9/10/92	Underneath fuel line T connection branching to west P.I.	1.5	Brown, silty, gravelly SAND
S5	9/10/92	Underneath fuel lines north of west P.I., south of USTs	1.5	Brown, silty, gravelly SAND
S6	9/10/92	Underneath fuel lines northwest of east P.I., south of USTs	1.5	Brown, silty, gravelly SAND
S7	9/10/92	UST array excavation Soil, south side - to ASR	8	Brown, silty, gravelly SAND
S8	9/10/92	UST array excavation Soil, west side	8	Brown, silty, gravelly SAND
S9	9/10/92	Southwest corner, bottom, of UST excavation	10	Brown, silty, gravelly SAND
S10	9/10/92	North wall, center of excavation	5 - 6	Brown, silty, gravelly SAND
S11	9/10/92	East wall, center of excavation	5 - 6	Brown, silty, gravelly SAND
S12	9/10/92	South wall, center of excavation	5 - 6	Brown, silty, gravelly SAND
S13	9/10/92	West wall, center of excavation	5 - 6	Brown, silty, gravelly SAND
S14	9/10/92	Excavation soils, west end of leaded gasoline UST	13	Brown, silty, gravelly SAND
S15	9/10/92	Excavation soils, east end of leaded gasoline UST	13	Brown, silty, gravelly SAND
S16	9/10/92	Excavation soils, west end of unleaded gasoline UST - to ASR	13	Brown, silty, gravelly SAND
S17	9/10/92	Excavation soils, east end of unleaded gasoline UST - to ASR	13	Brown, silty, gravelly SAND
S18	9/10/92	Excavation soils, west end of supreme gasoline UST - to ASR	13	Brown, silty, gravelly SAND
S19	9/10/92	Excavation soils, east end of supreme gasoline UST - to ASR	13	Brown, silty, gravelly SAND
S20	9/10/92	Northwest corner of excavation - to ASR	12	Brown, silty, gravelly SAND
S21	9/11/92	North wall, center of heating oil tank excavation	3	Brown, silty, gravelly SAND
S22	9/11/92	East wall, center of heating oil tank excavation	3	Brown, silty, gravelly SAND
S23	9/11/92	South wall, center of heating oil tank excavation	3	Brown, silty, gravelly SAND
S24	9/11/92	West wall, center of heating oil tank excavation	3	Brown, silty, gravelly SAND
S25	9/11/92	South side, bottom, below heating oil fill pipe end	6	Brown, silty, gravelly SAND
S26	9/11/92	North side bottom, below heating oil vent pipe end	6	Brown, silty, gravelly SAND
S27	9/14/92	Stockpile No. 1 (from soils west of west P.I.), North side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S28	9/14/92	Stockpile No. 1 (from soils west of west P.I.), East side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S29	9/14/92	Stockpile No. 1 (from soils west of west P.I.), South side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S30	9/14/92	Stockpile No. 1 (from soils west of west P.I.), West side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S31	9/14/92	Stockpile No. 1 (from soils west of west P.I.), Top, center	1.5 - 2.0	Brown, silty, gravelly SAND
S32	9/15/92	Underneath fuel line coupling, 5' south of canopy southern edge	3	Brown, silty, gravelly SAND
S33	9/15/92	Underneath fuel line, 2' north of elbow to south P.I.	3	Brown, silty, gravelly SAND
S34	9/15/92	Underneath center of east pump island	4	Brown, silty, gravelly SAND
S35	9/15/92	Underneath center of west pump island	4	Brown, silty, gravelly SAND
S36	9/15/92	Excavated soils from new UST site- to ASR	4	Brown, silty, gravelly SAND
S37	9/15/92	Duplicate of S35	4	Brown, silty, gravelly SAND
S38	9/15/92	Underneath center of south pump island	1.5 - 2.0	Brown, silty, gravelly SAND
S39	9/15/92	Waste oil tank excavation, north wall center	1.5 - 2.0	Brown, silty, gravelly SAND

0085

TABLE 1 - SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location (See Figure 1 and Table 2)	Depth (Ft)	Sample Classification
S40	9/15/92	Waste oil tank excavation, east wall center	1.5 - 2.0	Brown, silty, gravelly SAND
S41	9/15/92	Waste oil tank excavation, south wall center	1.5 - 2.0	Brown, silty, gravelly SAND
S42	9/15/92	Waste oil tank excavation, west wall center	1.5 - 2.0	Brown, silty, gravelly SAND
S43	9/15/92	Stockpile No. 2 (from W.O. excavation), north side, west end	1.5 - 2.0	Gray, slighly sandy PEA GRAVEL
S44	9/16/92	Stockpile No. 2 (from W.O. excavation), north side, center	1.5 - 2.0	Gray, slighly sandy PEA GRAVEL
S45	9/16/92	Stockpile No. 2 (from W.O. excavation), north side, east end	1.5 - 2.0	Gray, slighly sandy PEA GRAVEL
S46	9/16/92	Stockpile No. 2 (from W.O. excavation), south side, west end	1.5 - 2.0	Gray, slighly sandy PEA GRAVEL
S47	9/16/92	Stockpile No. 2 (from W.O. excavation), south side, center	1.5 - 2.0	Gray, slighly sandy PEA GRAVEL
S48	9/16/92	Stockpile No. 2 (from W.O. excavation), south side, east end	1.5 - 2.0	Gray, slighly sandy PEA GRAVEL
S49	9/16/92	Stockpile No. 2 (from W.O. excavation), top, west end	1.5 - 2.0	Gray, slighly sandy PEA GRAVEL
S50	9/16/92	Stockpile No. 2 (from W.O. excavation), top, east end	1.5 - 2.0	Gray, slighly sandy PEA GRAVEL
S51	9/16/92	Stockpile No. 2 (from W.O. excavation), west side, center	1.5 - 2.0	Gray, slighly sandy PEA GRAVEL
S52	9/16/92	Stockpile No. 2 (from W.O. excavation), east side, center	1.5 - 2.0	Gray, slighly sandy PEA GRAVEL
S53	9/17/92	Waste oil tank excavation, bottom, center	12 - 13	Brown, silty, gravelly SAND
S54	9/18/92	Stockpile No. 3 (from UST excavation), north side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S55	9/18/92	Stockpile No. 3 (from UST excavation), east side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S56	9/18/92	Stockpile No. 3 (from UST excavation), south side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S57	9/18/92	Stockpile No. 3 (from UST excavation), west side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S58	9/18/92	Stockpile No. 3 (from UST excavation), top, center	1.5 - 2.0	Brown, silty, gravelly SAND
S59	9/18/92	Stockpile No. 4 (from UST excavation), north side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S60	9/18/92	Stockpile No. 4 (from UST excavation), east side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S61	9/18/92	Stockpile No. 4 (from UST excavation), south side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S62	9/18/92	Stockpile No. 4 (from UST excavation), west side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S63	9/18/92	Stockpile No. 4 (from UST excavation), top, center	1.5 - 2.0	Brown, silty, gravelly SAND
S64	9/18/92	Stockpile No. 5 (from UST excavation), north side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S65	9/18/92	Stockpile No. 5 (from UST excavation), east side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S66	9/18/92	Stockpile No. 5 (from UST excavation), south side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S67	9/18/92	Stockpile No. 5 (from UST excavation), west side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S68	9/18/92	Stockpile No. 5 (from UST excavation), top, center	1.5 - 2.0	Brown, silty, gravelly SAND
S69	9/21/92	Stockpile No. 6 (from UST excavation), north side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S70	9/21/92	Stockpile No. 6 (from UST excavation), east side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S71	9/21/92	Stockpile No. 6 (from UST excavation), south side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S72	9/21/92	Stockpile No. 6 (from UST excavation), west side, center	1.5 - 2.0	Brown, silty, gravelly SAND
S73	9/21/92	Stockpile No. 6 (from UST excavation), top, center	1.5 - 2.0	Brown, silty, gravelly SAND

TABLE 2 - SUMMARY OF HEADSPACE AND ANALYTICAL RESULTS

		Headspace Sample Number (See Figure 1 and Table 1)													
Parameter	**Method**	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14
PID Headspace Reading-ppm	OVM 580B	886	3	7421	13	2.3	5	--	--	--	1	3	0	0	15.7

		Headspace Sample Number (See Figure 1 and Table 1)													
Parameter	**Method**	S15	S16	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28
PID Headspace Reading-ppm	OVM 580B	1.5	57.4	1.1	38.3	1238	--	3	1.7	1.5	1	3	7	1.1	0.7

		Headspace Sample Number (See Figure 1 and Table 1)													
Parameter	**Method**	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40	S41	S42
PID Headspace Reading-ppm	OVM 580B	0.3	1.9	0.3	0.3	0.3	22.4	1200	86	1200	62	0.3	0.3	0	0

		Headspace Sample Number (See Figure 1 and Table 1)													
Parameter	**Method**	S43	S44	S45	S46	S47	S48	S49	S50	S51	S52	S53	S54	S55	S56
PID Headspace Reading-ppm	OVM 580B	0.3	0	0	0	0	0	3	0	0	0.3	0.3	3.7	5.1	4.7

		Headspace Sample Number (See Figure 1 and Table 1)													
Parameter	**Method**	S57	S58	S59	S60	S61	S62	S63	S64	S65	S66	S67	S68	S69	S70
PID Headspace Reading-ppm	OVM 580B	1.6	4.5	3.9	11.9	6.3	3.2	19.1	22.8	330	1.5	3.4	5.9	958	1052

		Headspace Sample Number (See Figure 1 and Table 1)													
Parameter	**Method**	S71	S72	S73											
PID Headspace Reading-ppm	OVM 580B	1015	1035	834											

KEY	DESCRIPTION
--	SAMPLE NOT ANALYZED FOR THIS PARAMETER
ND	NOT DETECTED
*	SEE APPENDIX A FOR DETECTION LIMITS

0081

TABLE 2 - SUMMARY OF HEADSPACE AND ANALYTICAL RESULTS

		Sample Number (See Table 1 and Appendix A)													
Parameter	**Method***	S7	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20	S21	S22
PID Headspace Reading-ppm	OVM 580B	--	1	3	0	0	15.7	1.5	57.4	1.1	38.3	1238	--	3	1.7
Total Petroleum Hydrocarbons (TPH) - ppm	EPA 418.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gasoline Range Organics (GRO) - ppm	EPA 5030/8015	710	ND	ND	ND	ND	ND	ND	11	ND	ND	1500	45	--	--
Diesel Range Organics (DRO) - ppm	EPA 3550/8100	1800	ND	ND	ND	ND	40	24	160	ND	ND	120	23	91	140
Aromatic Volatile Organics	EPA 8020														
Benzene - ppm	EPA 8020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--
Toluene - ppm	EPA 8020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	--	--
Ethylbenzene - ppm	EPA 8020	ND	ND	ND	ND	ND	0.005	ND	0.07	ND	ND	1.5	ND	--	--
Xylenes - ppm	EPA 8020	58	0.007	ND	ND	ND	ND	ND	ND	ND	ND	290	2	--	--
Total BTEX	EPA 8020	58	0.007	ND	ND	ND	0.005	ND	0.07	ND	ND	293.1	2	--	--
Halogenated Volatile Organics	EPA 8010														
Methylene Chloride - ppm	EPA 8010	ND	--	--	--	--	--	--	ND	ND	ND	ND	ND	--	--
1,1 Dichloroethene - ppm	EPA 8010	0.039	--	--	--	--	--	--	ND	ND	ND	ND	ND	--	--
1,1,1 Trichloroethane - ppm	EPA 8010	ND	--	--	--	--	--	--	ND	ND	ND	ND	ND	--	--
Total Metals															
Arsenic - ppm	EPA 7060	3.4	--	--	--	--	--	--	2	--	4	4	4	--	--
Chromium - ppm	EPA 7191	20	--	--	--	--	--	--	20	--	18	20	22	--	--
Lead - ppm	EPA 7421	76	75	75	2	4	79	43	64	35	37	57	32	--	--
TCLP Metals	EPA 1311														
Lead - ppm	EPA 1311/7421	ND	--	--	--	--	--	--	--	--	--	--	--	--	--

KEY	DESCRIPTION
--	SAMPLE NOT ANALYZED FOR THIS PARAMETER
ND	NOT DETECTED
*	SEE APPENDIX A FOR DETECTION LIMITS

0088

TABLE 2 - SUMMARY OF HEADSPACE AND ANALYTICAL RESULTS

		Sample Number (See Table 1 and Appendix A)													
Parameter	**Method***	S23	S25	S26	S27	S30	S32	S33	S34	S35	S36	S37	S38	S39	S40
PID Headspace Reading-ppm	OVM 580B	1.5	3	7	1.1	1.9	0.3	0.3	22.4	1200	86	1200	62	0.3	0.3
Total Petroleum Hydrocarbons (TPH) - ppm	EPA 418.1	--	--	--	--	--	--	--	--	--	--	--	--	33	87
Gasoline Range Organics (GRO) - ppm	EPA 5030/8015	--	--	--	--	--	ND	ND	ND	1000	540	1700	1	ND	ND
Diesel Range Organics (DRO) - ppm	EPA 3550/8100	180	330	42	10	20	150	ND	14	440	260	--	62	ND	34
Residual Hydrocarbons (RPH) - ppm	**													33	53
Aromatic Volatile Organics	EPA 8020														
Benzene - ppm	EPA 8020	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene - ppm	EPA 8020	--	ND	ND	ND	ND	ND	ND	ND	ND	11	0.55	ND	ND	ND
Ethylbenzene - ppm	EPA 8020	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes - ppm	EPA 8020	--	0.087	ND	ND	ND	ND	ND	ND	68	54	340	0.06	ND	ND
Total BTEX	EPA 8020	--	0.087	ND	ND	ND	ND	ND	ND	68	65	341	0.06	ND	ND
Halogenated Volatile Organics	EPA 8010														
Methylene Chloride - ppm	EPA 8010	--	--	--	ND	ND	--	--	--	--	ND	--	--	--	--
1,1,1 Trichloroethane - ppm	EPA 8010	--	--	--	ND	ND	--	--	--	--	ND	--	--	--	--
Total Metals															
Arsenic - ppm	EPA 7060	--	--	--	16	22	--	--	--	--	4	--	--	--	--
Chromium - ppm	EPA 7191	--	--	--	18	26	--	--	--	--	16	--	--	--	--
Lead - ppm	EPA 7421	--	22	27	3.6	3.6	51	4	8	6	27	--	61	--	--

KEY	DESCRIPTION
--	SAMPLE NOT ANALYZED FOR THIS PARAMETER
ND	NOT DETECTED
*	SEE APPENDIX A FOR DETECTION LIMITS
**	RPH = TPH - GRO - DRO

0089

TABLE 2 - SUMMARY OF HEADSPACE AND ANALYTICAL RESULTS

		Sample Number (See Table 1 and Appendix A)											
Parameter	**Method***	S41	S42	S43	S44	S49	S53	S55	S60	S65	S70	SPK	TB
PID Headspace Reading-ppm	OVM 580B	0	0	0.3	0	3	0.3	5.1	11.9	330	1052	--	--
Total Petroleum Hydrocarbons (TPH) - ppm	EPA 418.1	30	51	--	--	--	82	--	--	--	--	--	--
Gasoline Range Organics (GRO) - ppm	EPA 5030/8015	ND	ND	ND	--	ND	ND	1	1	210	700	1300	--
Diesel Range Organics (DRO) - ppm	EPA 3550/8100	ND	ND	23	--	11	ND	100	120	350	370.0	--	--
Residual Hydrocarbons (RPH) - ppm	**	30	51				82						
Aromatic Volatile Organics	EPA 8020/602												
Benzene - ppm	EPA 8020/602	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	0.048	ND
Toluene - ppm	EPA 8020/602	ND	ND	ND	--	ND	ND	ND	ND	ND	45	0.045	ND
Ethylbenzene - ppm	EPA 8020/602	ND	ND	ND	--	ND	ND	ND	ND	0.190	18	0.045	ND
Xylenes - ppm	EPA 8020/602	ND	ND	ND	--	ND	ND	ND	ND	23	130	0.094	ND
Total BTEX	EPA 8020/602	ND	ND	ND	--	ND	ND	ND	ND	23.19	193	0.232	ND
Polychlorinated Biphenyls (PCBs) - ppm	EPA 8080	--	--	ND	--	--	ND	--	--	--	--	--	--
Halogenated Volatile Organics (HVO) - ppm	EPA 8010	--	--	ND	--	--	ND	--	--	--	ND	--	--
Total Metals													
Arsenic - ppm	EPA 7060	--	--	--	--	--	--	2	3	3	ND	--	--
Chromium - ppm	EPA 7191	--	--	--	--	--	--	19	19	18	16	--	--
Lead - ppm	EPA 7421	--	--	--	--	--	--	31	31	55	21	--	--
TCLP Metals	EPA 1311												
Arsenic - ppm	EPA 1311/7060	--	--	ND	--	--	ND	--	--	--	--	--	--
Barium - ppm	EPA 1311/6010	--	--	ND	--	--	ND	--	--	--	--	--	--
Cadmium - ppm	EPA 1311/7131	--	--	ND	--	--	ND	--	--	--	--	--	--
Chromium - ppm	EPA 1311/7191	--	--	ND	--	--	ND	--	--	--	--	--	--
Mercury - ppm	EPA 1311/7470	--	--	ND	--	--	ND	--	--	--	--	--	--
Lead - ppm	EPA 1311/7421	--	--	ND	--	--	ND	--	--	--	--	--	--
Selenium - ppm	EPA 1311/7740	--	--	ND	--	--	ND	--	--	--	--	--	--
Silver - ppm	EPA 1311/6010	--	--	ND	--	--	ND	--	--	--	--	--	--

KEY	DESCRIPTION
--	SAMPLE NOT ANALYZED FOR THIS PARAMETER
ND	NOT DETECTED
*	SEE APPENDIX A FOR DETECTION LIMITS
**	RPH = TPH - GRO - DRO

0090

Send Report and Bill to Chevron Contact: ☐ No

Chain-of-Custody-Record

Chevron U.S.A. Inc.
P.O. BOX 5004
San Ramon, CA 94583
FAX (415)842-9591

Chevron Facility Number: 9-6097
Facility Address: 303 W Fireweed Lane
Consultant Project Number: 45144-2
Consultant Name: Shannon & Wilson
Address: 5430 Fbks St Ste 3
Project Contact (Name): Curt Conner
(Phone): 907-561-2120 Fax Number: 907-561-4483

Chevron Contact (Name):
(Phone):
Laboratory Name: Superior Analytical, Inc
Laboratory Release Number: 7899200
Samples Collected by (Name): Curt Conner
Collection Date: 9/11
Signature: Curtis Conner

Sample Number	Lab Sample Number	Number of Containers	Matrix: Soil = S, Water = W, A = Air, C = Charcoal	Type: G = Grab, C = Composite, D = Discrete	Time	Sample Preservation	Iced (Yes)	Analyses To Be Performed: BTEX + TPH GAS (8020 + 8015)	TPH-Diesel (3550/8100) (8015) (LUFT) (DRO)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd, Cr, Pb, Zn, Ni (ICAP or AA)	3550/8100 Diesel Range Org. Return Cooler and Blue Ice to S&W
5144-S21					9-11 2:55		✓		✓							Soil
" S22					9-11 2:59		✓		✓							"
" S23					9-11 3:02		✓		✓							"
" S25					9-11 3:10		✓		✓			✓				"
" S26					9-11 3:14		✓		✓			✓				"
					[illegible]											"

1600

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Curtis C Conner	S&W	9/14/92 7:30			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time

Turn Around Time (Circle Choice)
(24 Hrs.) 48 Hrs. 5 Days 10 Days As Contracted

24 HR TURN AROUND PLEASE

Lab Report and COC to Chevron Contact: ☐ No

Chain-of-Custody-Reco

Chevron U.S.A. Inc.
P.O. BOX 5004
San Ramon, CA 94583
FAX (415)842-9591

Chevron Facility Number: G-6097
Facility Address: 303 W. Fireweed
Consultant Project Number: Y5144-2
Consultant Name: Shannon & Wilson
Address: 5430 Fb Ks St. Ste 3
Project Contact (Name): Curt Conner
(Phone) 907-561-2120 (Fax Number) 907-561-4483

Chevron Contact (Name): Phil Briggs
(Phone):
Laboratory Name: Superior Analytical, Inc
Laboratory Release Number: 7899200
Samples Collected by (Name): Curt Conner
Collection Date: 9/14/92
Signature: Curtis Conner

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iced (Yes or No)	Analyses To Be Performed: BTEX + TPH GAS (8020 + 8015)	TPH Diesel (8015) (3550/Blocks) (5/00)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd,Cr,Pb,Zn,Ni (ICAP or AA) Total / TCLP Ag, Cr, Pb					Remarks
Y5144-2 527		1		X	245			X	X		X				X					Soil
" 530		1		X	300			X	X		X				X					"

Return Cooler & Blue Ice to S&W

0092

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Curtis C. Conner	S&W	9/15/92 7:00			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time

Turn Around Time (Circle Choice)
(24 Hrs.) 24 hour turnaround
48 Hrs.
5 Days
10 Days
As Contracted

Fax copy of Lab Report and COC to Chevron Contact: ☐ No

Chain-of-Custody-Record

Chevron U.S.A. Inc.
P.O. BOX 5004
San Ramon, CA 94583
FAX (415)842-9591

Chevron Facility Number: G-6097
Facility Address:
Consultant Project Number: 5144-2
Consultant Name: Shannon & Wilson
Address: 5430 Fbks St Ste 3
Project Contact (Name): Curt Conner / Tina Terry
(Phone) 907 561 2120 (Fax Number) 907 561 4483

Chevron Contact (Name): Phil Briggs
(Phone)
Laboratory Name: Superior Analytical, Inc
Laboratory Release Number: 7899200
Samples Collected by (Name): Curt Conner
Collection Date: 9/16/92
Signature: Curtis C. Conner

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil A = Air W = Water C = Charcoal	Type G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iced (Yes) or No)	BTEX + TPH GAS (8020 + 8015) 8020 5030 8015	TPH Diesel 3550/8100 (8015) (S / WC)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals CA,Cr,Pb,Zn,Ni (ICAP or AA)	Total metals As, Cr Pb 6000/7000	Total Pb 7421				Remarks
5144-2 S36		1			9/15 1:10		X	X	X		X					X					501
" S32		1			9/15 11:05		X	X	X							[redacted]	X				"
" S33		1			9/15 11:10		X	X	X							[redacted]	X				"
" S34		1			9/15 1:00		X	X	X							[redacted]	X				"
" S35		1			9/15 12:50		X	X	X							[redacted]	X				"
" S37		1			9/15 1:10		X	X													"
" S38		1	[redacted]		9/15 305		X	X	X							[redacted]	X				"

24 hour turn around please return Coolers & blue ice to S&W

0063

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Curtis C. Conner	S&W	9/16/92 8:00			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time

Turn Around Time (Circle Choice)
(24 Hrs.)
48 Hrs.
5 Days
10 Days
As Contracted

Chevron U.S.A. Inc.
P.O. BOX 5004
San Ramon, CA 94583
FAX (415)842-9591

Chevron Facility Number: 9-6097
Facility Address:
Consultant Project Number: Y5144-2
Consultant Name: Shannon & Wilson
Address: 5430 Fbks St Ste 3
Project Contact (Name): Curt Conner / Tina Terry
(Phone) 907 561 2120 (Fax Number) 907 561 4483

Chevron Contact (Name): Phil Briggs
(Phone):
Laboratory Name: Superior Analytical, Inc
Laboratory Release Number: 7899200
Samples Collected by (Name): Curt Conner
Collection Date: 9/16/92
Signature: Curtis C. Conner

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil A = Air W = Water C = Charcoal	Type (G) = Grab C = Composite D = Discrete	Time	Sample Preservation	Iced (Yes or No)	BTEX + TPH GAS (8020 + 8015) 8020 5030/8015	TPH Diesel 3550/8100 (8015)(8100)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd,Cr,Pb,Zn,Ni (ICAP or AA)	Total metals As, Cr, Pb 6010/7000	total Pb 7421			Remarks
5144-2 S36	1	1			9/15 1:10		x	X	X		X					x				Soil
" S32	2	1			9/15 11:05		x	X	+							~~X~~	X			"
" S33	3	1			9/15 11:10		x	X	+							~~X~~	X			"
" S34	4	1			9/15 1:00		x	X	x							~~X~~	+			" ☆
" S35	5	1			9/15 12:50		x	X	x							~~X~~	X			" ☆
" S37	6	1			9/15 1:10		x	x												"
" S38	7	1	~~X~~		9/15 3:05		X	X	X							~~X~~	x			" ☆

Remarks: 24 hour turn around please return cooler & blue ice to S&W

☆ these three are the TOP PRIORITY per Curt Conner 9/16/92 NAW

Please initial: BLO
Samples Stored in ice ✓
Appropriate containers ✓
Samples preserved ✓
VOA's without headspace
Comments:

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Curtis C. Conner	S&W	9/16/92 8:00			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature): Brenda L. Ol. SAL		9/17/92 9:00

Turn Around Time (Circle Choice)
(24 Hrs.) [circled]
48 Hrs.
5 Days
10 Days
As Contracted

0094

Fax copy of Lab Report and COC to Chevron Contact: ☐ Yes ☐ No 8e734 Chain-of-Custody-Record

Chevron U.S.A. Inc.
P.O. BOX 5004
San Ramon, CA 94583
FAX: (415)842-8591

Chevron Facility Number: 9-6097
Facility Address: 303 W Fireweed
Consultant Project Number: 75144-2
Consultant Name: Shannon & Wilson
Address: 5430 Fbks St, Ste 3
Project Contact (Name): Curtis Conner
(Phone): 907 561-2120 (Fax Number): 907 561 4483

Chevron Contact (Name): Phil Briggs
(Phone):
Laboratory Name: Superior Analytical, Inc
Laboratory Release Number: 7899200
Samples Collected by (Name): Curt Conner
Collection Date:
Signature: Curtis Conner

Sample Number	Lab Sample Number	Number of Containers	Matrix: S = Soil, W = Water, A = Air, C = Charcoal	Type: G = Grab, C = Composite, D = Discrete	Time	Sample Preservation	Iced (Yes) or No	BTEX + TPH GAS (8020 + 8015)	TPH Diesel (8015) (S/WW)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd, Cr, Pb, Zn, Ni (ICAP or AA)	TPH 418.1	TCLP metals As, Ba, Cd, Cr, Hg, Pb, Se, Ag; PCBs, Pest			Remarks
5144-2 S39			S	G	9/16 9:40		X	X	X							X				5 day
S40			"	"	9/16 9:50		X	X	X							X				"
S41			"	"	9/16 9:45		X	X	X							X				"
S42			"	"	9/16 9:55		X	X	X							X				"
S43			"	"	9/16 9:45		X	X	X		X						X	X		24 hours
S49			"	"	9/16 3:15		X	X	X											"
S53			"	"	9/17 10:40		X	X	X		X					X	X	X		"
																				~~24 hours~~

Please initial:
Samples Stored in ice ✓
Appropriate containers ✓
Samples preserved ✓
VOA's without headspace
Comments:

0095

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Curtis C. Conner	S&W	9/17 11:30			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature) Brenda L. O		Date/Time 9/18/92

Turn Around Time (Circle Choice)
24 Hrs.
48 Hrs.
5 Days
10 Days
As Contracted

Fax copy of Lab Report and COC to Chevron Contact: ☐ Yes ☐ No

Chain-of-Custody-Record

Chevron U.S.A. Inc.
P.O. BOX 5004
San Ramon, CA 94583
FAX: (415)842-9591

Chevron Facility Number: 9-6097
Facility Address: 303 W. Firweed Lane
Consultant Project Number: 45144-2
Consultant Name: Shannon & Wilson
Address: 5430 Fbks. St., Ste 3
Project Contact (Name): Curt Conner / Jim Terry
(Phone): 907 561-2120 (Fax Number): 907 561 4483

Chevron Contact (Name): Phil Briggs
(Phone):
Laboratory Name: Superior Analytical, Inc.
Laboratory Release Number: 7899200
Samples Collected by (Name): Matt Yancey
Collection Date: 9/18/92
Signature: Curt Conner

Sample Number	Lab Sample Number	Number of Containers	Matrix (S = Soil, W = Water, A = Air, C = Charcoal)	Type (G = Grab, C = Composite, D = Discrete)	Time	Sample Preservation	Iced (Circle Yes or No)	Analyses To Be Performed: BTEX + TPH GAS (M020 + M015)	TPH Diesel (M015) (S/DU)	Oil and Grease (5520)	Purgeable Halocarbons (M010)	Purgeable Aromatics (M020)	Purgeable Organics (M240)	Extractable Organics (M270)	Metals Cd,Cr,Pb,Zn,Ni (ICAP or AA)	Pb As, Cd, Ag, Se				Remarks
5144-2555	(1)				9/18 2:40		X	X	X							X				
" 560	(2)				9/18 3:00		X	X	X							X				
" ~~565~~	(3)				9/18 3:25		X	X	X							X				

Rush

600

Please Initial:
Samples Stored In ice.
Appropriate containers
Samples preserved
VOA's without headspace
Comments:

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time	Turn Around Time (Circle Choice)
Curtis C. Conner	S&W	9/19/92 1:00				24 Hrs.
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time	48 Hrs.
						5 Days
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time	10 Days
			Kenneth L. Wilson		9/21/92 10:00	As Contracted

Fax copy of Lab Report and COC to Chevron Contact: ☐ Yes ☐ No 86741

Chain-of-Custody-Record

Chevron U.S.A. Inc.
P.O. BOX 5004
San Ramon, CA 94583
FAX (415)842-9591

Chevron Facility Number: 9-6097
Facility Address: 303 W. FIREWEED LN.
Consultant Project Number: Y5144-2
Consultant Name: SHANNON + WILSON
Address:
Project Contact (Name): CURT CONNER
(Phone) (907) 561-2120 (Fax Number) 561-4483

Chevron Contact (Name): Phil Briggs
(Phone):
Laboratory Name: Superior Analytical, Inc
Laboratory Release Number: 7899200
Samples Collected by (Name):
Collection Date: 9-21-92
Signature:

Sample Number	Lab Sample Number	Number of Containers	Matrix W = Water S = Soil A = Air C = Charcoal	Type G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iced (Yes or No)	Analyses To Be Performed: BTEX + TPH GAS (8020 + 8015)	TPH Diesel (8015) (S/DU)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd, Cr, Pb, Zn, Ni (ICAP or AA) total & Cr VI					Remarks
Y5144-2570		1	S	G	9/21 12:20		X	X	X							X				RUSH

Please Initial:
Samples Stored in ice
Appropriate containers
Samples preserved
VOA's without headspace
Comments:

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Matt M	Shannon + Wilson	9/21 1:00			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)	Date/Time	
			Nancy A. Nelson	9/22/92 10:08	

Turn Around Time (Circle Choice)
(24 Hrs.)
48 Hrs.
5 Days
10 Days
As Contracted

Fax copy of Lab Report and COC to Chevron Contact: ☐ No 1347

Chain-of-Custody-Record

Chevron U.S.A. Inc.
P.O. BOX 5004
San Ramon, CA 94583
FAX: (415)842-9591

Chevron Facility Number: 9-6097
Facility Address: 303 W. FIRENZE
Consultant Project Number: 5144-2
Consultant Name: SHANNON & WILSON
Address: 5430 FAIRBANKS ST SUITE #3
Project Contact (Name): KURT CONNER / TIM TERRY
(Phone): 561-2120 (Fax Number): 561-4233

Chevron Contact (Name):
(Phone):
Laboratory Name: Superior Analytical, Inc.
Laboratory Release Number: 7899200
Samples Collected by (Name): KURT CONNER
Collection Date: 11 SEPT 92
Signature:

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iced (Yes or No)	Analyses To Be Performed: BTEX + TPH (gas) (8020 + 8015) / (5030/8015/8020)	TPH (diesel) (8015) (5030/8015)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)/602	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd, Cr, Pb, Zn, Ni (ICAP or AA)	TPH (gas) / Lead EPA 7421	Total Arsenic / Chromium / Lead			Remarks
5144-2-SPL		1	water									✓								5 day Rush only
5144-2-TB		1	water									✓								
5144-2-S10		1	soil		11:00			✓	✓							✓				
5144-2-S11		1			11:04			✓	✓							✓				
5144-2-S12		1			11:07			✓	✓							✓				
5144-2-S13		1			11:11			✓	✓							✓				
5144-2-S14		1			11:13			✓	✓							✓				24 hr turnaround
5144-2-S15		1			11:15			✓	✓							✓				
5144-2-S16		1			11:17			✓	✓							✓				
5144-2-S17		1			11:19			✓	✓							✓				
5144-2-S18		1			11:20			✓	✓							✓				
5144-2-S19		1			11:25			✓	✓							✓				
5144-2-S20		1	GW		11:00			✓	✓		✓						✓			24 hr Rush
[illegible]		[illegible]						[illegible]	[illegible]		[illegible]						[illegible]			

Samples Stored in Ice. ✓
Appropriate containers. ✓
Samples preserved. ✓
VOA's without headspace. ✓
Comments:

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
[signature]	Shannon & Wilson	12:50 PM / 11 SEPT 92			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time
			[signature]		9/14/92 1000

Turn Around Time (Circle Choice)
(24 Hrs.)
48 Hrs.
5 Days
10 Days
As Contracted

8600