SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FAIRBANKS
ANCHORAGE
SAINT LOUIS
BOSTON

August 19, 1994



102.26.096

Davidson, Inc.
1551 Larue Lane
Fairbanks, Alaska 99709

Attn: Ms. Janie Feist

**RE: UNDERGROUND STORAGE TANK CLOSURE, 230 OLD STEESE HIGHWAY SITE NO. 2742, FAIRBANKS, ALASKA**

This report presents the results of our site assessment performed for closure of the 500-gallon used-oil underground storage tank (UST) located at the 230 Old Steese Highway site in Fairbanks, Alaska. The work was performed in accordance with our March 1994 Work Plan, with the Alaska Department of Environmental Conservation (ADEC) Underground Storage Tank Regulations (18 AAC 78), and our Quality Assurance Program Plan (QAPP), which is on file with ADEC. The scope of work performed by Shannon & Wilson included observation of the UST removal, over-excavation of impacted soils, and the collection of soil and waste-oil samples for analytical testing. The excavation and removal of the UST was performed by Soil Services, Inc. (SSI) of Fairbanks (UST license # AA101).

Background and Project Approach

The project site, approximately 12,000 square feet in area, is located at 230 Old Steese Highway in Fairbanks, as shown in Figure 1. The legal description of the property is Tract B, Block 9, Graehl Townsite. A frame building, currently occupied by Owl Tree Bridal Salon, is located on the southwest corner of the site. A gas station was operated on the property, out of the building, from about the early 1960s to the early 1980s. Site data suggests that up to five 4,000-gallon gasoline USTs and one 500-gallon used-oil UST were located at the property. According to the current property owner, Mr. Lynn Davidson, three gasoline USTs were removed about 1982.

Shannon & Wilson began site assessment and release investigation activities at the site in January 1993. The site assessment activities included review of background historical data, installation of four monitoring wells, three soil borings, and soil and water sampling and analysis. Results of the site assessment/release investigation indicated that soil contamination was present at the site at concentrations that exceed applicable ADEC cleanup levels. Free-phase floating product was observed in on-site monitoring wells, and groundwater parameters benzene, ethylbenzene,

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toluene, xylenes and 1,2-dichloroethane exceeded state and federal Maximum Contaminant Levels (MCLs).

A corrective action plan for this site is presented in our project work plans dated March 1994. The corrective action plans include UST removal, groundwater monitoring, and the installation of an air injection/sparging system at the site. Our approach for this phase of the corrective action was to remove the 500-gallon used-oil tank and any remaining 4,000-gallon gasoline USTs. Over-excavation of contaminated soil would be limited to darkly stained soils from the used-oil UST excavation and only grossly contaminated soils removed during exploration/excavation for the 4,000-gallon USTs.

Field Activities

The 500-gallon used-oil UST and associated piping were removed on June 21, 1994. UST removal operations were monitored and documented by Mr. David Dinkuhn, an engineer with our firm. During the UST removal and excavation activities, a photoionization detector (PID; Photovac MicroTIP HL-2000) was used to measure the relative concentration of volatile organic compounds present in the soil and to monitor air quality in the vicinity of the excavations. PID readings were obtained for approximately every 5 cubic yards of soil excavated. The observed PID readings for the soils from the excavations ranged from nondetectable to 1,000 parts per million (ppm).

The location of the used-oil UST was tentatively identified based on the tank system drawings and using a metal detector. However, the tank was not unearthed at the apparent location, but four pipes, apparently vent piping from the former USTs, explaining the strong magnetic signal that had been observed. The excavation was extended towards the building and the used-oil UST was discovered beneath the concrete walkway addition to the building. The UST was buried at a depth of about 3 feet. The location of the UST and site excavations are shown on Figure 1.

A small concrete pad was located over the UST through which a 2-inch-diameter riser pipe was accessible from the surface. A 2-inch lateral-fill pipe extending from beneath the building was plumbed into an additional opening located on the same end of the UST as the riser pipe (see photo #1). Darkly stained soil was observed above the UST around the riser pipe and around the eastern side of the UST, indicating that spillage had probably occurred when product was poured into the riser pipe from the ground surface. Apparently, the stained soils beside the tank were contaminated by product migrating downward from around the riser pipe. No darkly

stained soils were observed beneath the UST or on its western or southern side. The riser pipe was removed, and the approximately 223 gallons of waste oil in the UST was removed with a vacuum truck. The lateral pipe was unscrewed from the joint located beneath the building and removed. The UST was then pulled out of the excavation, inerted, cleaned, and removed from the site for disposal. Approximately 22 gallons of sludge was shoveled from the bottom of the UST prior to cleaning. Approximately 20 gallons of rinsate water was generated during cleaning activities. The waste oil, sludge, and rinsate were contained in 55-gallon drums and stored on site.

Following the removal of the UST, the darkly stained soils observed around the UST were removed. A total of about six cubic yards of darkly stained soils were stockpiled on site and covered with a Visqueen tarp. The excavation was then backfilled with pea gravel and the remaining non contaminated native soil excavated during the UST removal.

To investigate the presence of any 4,000-gallon USTs remaining on site, a trench was excavated in the suspected location of the USTs. The trench was excavated to a depth of six feet for a length of 30 feet as shown in Figure 1. No USTs were exposed in the trench. About 15 cubic yards of apparently contaminated soil excavated from the trench were stockpiled on site and covered with a Visqueen tarp. The trench was then backfilled with the remaining noncontaminated soils and imported pit run.

Sample Analysis

Analytical samples were collected from the soils at the base of the used-oil UST excavation (within 2 feet of the tank bottom) and from the contaminated and apparently clean soils excavated during tank closure. One soil sample was collected from the excavated soils from the trench excavation. A composite sample of the five drums was collected for the waste-oil sample and one sample was collected from the sludge from the bottom of the used-oil tank. The samples were submitted to North Creek Analytical of Bothell, Washington for analytical testing. Sample locations and descriptions are included in Table 1 and Figure 1.

The soil sample collected from the trench excavation was submitted for analysis of gasoline-range organics (GRO) by EPA 8015 modified, benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA 8020, diesel-range organics (DRO) by EPA 8100 modified. The soil samples collected from the used-oil tank excavation were submitted for analysis of total petroleum hydrocarbons (TPH) by EPA 418.1, polychlorinated biphenals (PCB) by EPA 8080, volatile organic compounds (VOCs) by EPA 8240, and total RCRA metals by EPA 6010. The waste

oil and sludge samples were submitted for analysis for energy recovery screening (PCBs, total halogens, flash point, and total As, Cd, Cr, and Pb). A subsequent analysis of the waste oil was requested for halogenated volatile organics (HVO) by EPA 8010 and TCLP volatile organics by EPA 1311/8240 because the test results of total halogens for the energy recovery screening test exceeded 1,000 ppm.

Results

Sample analytical results are shown in Table 2 and summarized below. Analytical results for the soil sample (#8) from the trench excavation stockpile reported the GRO at 100 ppm, benzene and toluene as not above the detection limits, ethylbenzene at 0.13 ppm, total xylenes at 7.6 ppm, and DRO at 65 ppm.

Analytical results for the five soil samples collected from the used-oil UST excavation (samples 1 to 5) reported PCBs, volatile organics, and the total RCRA metals arsenic, cadmium, selenium and silver as not being present above the detection limits. TPH ranged from not above the detection limits to 9,100 ppm, and barium ranged from 78 to 100 ppm, chromium ranged from 10 to 19 ppm, lead ranged from 11 to 81 ppm, and mercury ranged from 0.037 to 0.05 ppm.

Analytical results of the waste-oil composite sample (sample 06) for energy recovery analysis reported PCBs as not above the detection limits, total halogens at 1,300 ppm, flash point at greater than 100°C, and total arsenic and cadmium as not above the detection limits. Chromium was reported to contain 0.92 ppm, and lead was report to contain 440 ppm. Results of the volatile organic compounds indicted tetrachloroethene and 1, 1, 1-Trichloroethane at concentrations slightly above the detection limits. Results of the TCLP volatile organic analysis reported benzene at 0.93 ppm and methyl ethyl ketone at 0.68 ppm.

The analytical results of the used-oil sludge sample (sample 07) for energy recovery analysis reported PCBs as not above the detection limits, total halogens at 33,000 ppm, flash point greater than 100°C, and arsenic as not above the detection limits, cadmium at 1.5 ppm, chromium at 12 ppm and lead at 28,000 ppm.

Quality Assurance/Quality Control

Quality Assurance (QA) and Quality Control (QC) procedures are used to see that sampling, and laboratory data are effective and do not detract from the quality of the results. QA/QC procedures included the collection of a field duplicate sample and laboratory quality control. Field duplicate samples were collected to evaluate the measure of analytical precision (measured

in relative percent difference, or RPD). The laboratory quality control consisted of procedures outlined in the laboratory's approved standard operating procedures document on file with ADEC.

According to the analytical case narratives submitted by the laboratory, the QA/QC results generally were within acceptable limits for all analyses performed, and all samples were analyzed within the required holding times. The laboratory reported that the quality control data for PCB in the sludge sample could not be accurately calculated due to matrix interference. In addition, QC laboratory results for volatile organics resulted in a slightly high recovery for 1, 1-DCE which increased the value of the RPD. Spike recovery for Hg for soil was outside the established control limits.

The QA/QC data generally fell within the data quality objectives (DQO) established in Shannon & Wilson's QAPP. One exception is a PCB duplicate matrix spike recovery of 166%, which is outside of our DQO of 60% to 140%. The recovery result was within the laboratory's DQO of 3% to 190%. These exceptions are not considered significant to detract from the overall quality and accuracy of the laboratory results.

Discussion

Prior investigations at this site had suggested the possibility that one or two additional USTs may have been present, but not removed with the closure of the USTs in 1982. We investigated this possibility by excavating a 30-foot-long by 6-foot-deep trench at the suspected location of the USTs. No additional USTs were uncovered in the trench. Based on this exploration, our observations of four apparently UST ventilation pipes uncovered during the used-oil tank closure work, we conclude that at least four 4,000-gallon USTs were removed in 1982 and no additional USTs were present in that location.

This site assessment reports the closure by removal of a 500-gallon used-oil tank from the site in accordance with our corrective action plan. Based on the test results, the soils remaining in the bottom of the used-oil UST excavation and the clean native soils replaced in the used-oil UST excavation are below regulatory action levels.

The contaminated stockpiled soils from the used-oil UST excavation and from the exploratory trench excavation were above the cleanup levels for TPH and GRO, respectively. Both stockpiles were delivered to Organic Incineration Technology (OIT) of Fairbanks where they will be remediated by incineration. The soils were delivered by SSI on August 8, 1994.

The waste oil from the used-oil tank exceeded the action limit of 1,000 ppm for total halogens; however, the results of the halogenated volatile organics test by EPA method 8010 successfully rebut the presumption that the used oil was mixed with halogenated hazardous waste. The waste oil had less than the allowable concentration of 4,000 ppm total halogens. The waste oil was delivered by Lynden Transport, Inc. of Fairbanks on August 9, 1994, to Alaska Pollution Control, Inc. of Anchorage for recycling by energy recovery. A copy of the used-oil shipping manifest is enclosed with this report.

Based on a total halogens content of 33,000 ppm and a total lead content of 28,000 ppm, the sludge from the waste-oil UST is designated as a hazardous waste. The rinsate water from the UST cleaning operations may be contaminated by hazardous constituents from the sludge at concentrations that would cause the rinsate to also be designated as hazardous waste. Because the ADEC does not allow for the disposal of hazardous waste in the UST program, the drum of sludge and rinsate will be disposed of under a separate scope of services from the ADEC UST Financial Assistance Program.

Completed ADEC post-closure information and closure checklist forms for the 500-gallon waste-oil UST are enclosed with this letter.

Limitations

This letter presents conclusions based on the sampling and analysis criteria established by ADEC for underground storage tank closures. The soil samples were intended to evaluate the presence or absence of hydrocarbon-affected soil at the locations selected. It was not the intent of our assessment to detect the presence of soil affected by contaminants other than those for which laboratory analyses were performed. No conclusions can be drawn on the presence or absence of other contaminants.

The data presented in this report should be considered representative at the time of our site observations. Changes in the observed conditions can occur with the passage of time, whether they be due to natural processes or from human activities on this or adjacent properties. In addition, changes in Government Codes, regulations, or laws may occur. Due to such changes, our observations and conclusions may need to be revised wholly or in part, due to changes beyond our control.

This report was prepared for the exclusive use of Davidson, Inc., its agents, and ADEC in performance of a site assessment for closure of an underground storage tank and in accordance

with the approved Corrective Action Plan. If it is made available to others, it should be for information on factual data only and not as a warranty of subsurface conditions, such as those interpreted from the discussions of subsurface conditions included in this report.

We trust that this information is sufficient for your needs at the present time. If you have any questions, please do not hesitate to call.

Sincerely,

**SHANNON & WILSON, INC.**

By: David Dinkuhn
David L. Dinkuhn
Engineer

Reviewed By: David M. McDowell
David McDowell
Associate

DD:DMM/laf

cc: ADEC, Ben Thomas

Enclosures:
Table 1 Sample Descriptions
Table 2 Analytical Results Summary
Figure 1 Sample Location Plan
Site Photo # 1
Appendix A Analytical Laboratory Report
Appendix B Important Information About Your Environmental Site Evaluation/Assessment Report

# TABLE 1: SAMPLE LOCATIONS AND DESCRIPTIONS

| Sample Number | Date | Sample Location (See Fig. 1) | Depth (ft) | Matrix |
|---|---|---|---|---|
| 01 | 6/21/94 | Native Soil Replaced in UST Excavation | Varies | Gray, Sandy GRAVEL |
| 02 | " | Excavation Bottom, North End of UST | 8 | Gray SILT |
| 03 | " | Duplicate of Sample 02 | 8 | Gray SILT |
| 04 | " | Composite of Contaminated Stockpile from Waste Oil UST Excavation | Varies | Gray, Sandy GRAVEL |
| 05 | " | Excavation Bottom, South End of UST | 8 | Gray SILT |
| 06 | " | Composite of Waste Oil | N/A | Oil |
| 07 | " | Composite of Sludge | N/A | Sludge |
| 08 | " | Composite of Contaminated Stockpile From Trench Excavation | 8 | Gray, Sandy SILT |

# TABLE 2: ANALYTICAL RESULTS SUMMARY

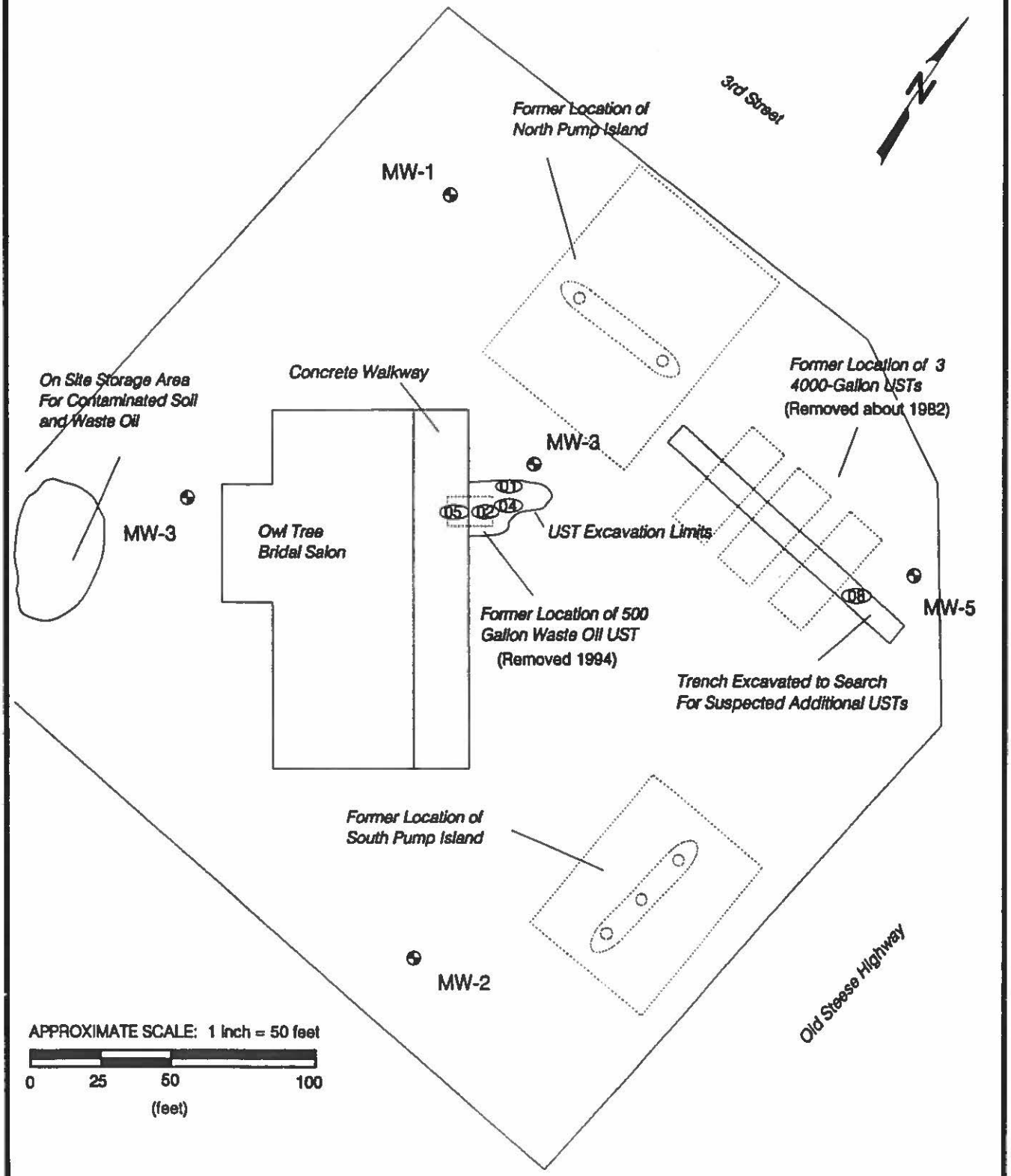
| | | Sample Number (See Table 1 For Sample Loc.) | | | | |
|---|---|---|---|---|---|---|
| Parameter | Method | 01 | 02 | 03* | 04 | 05 |
| Matrix | | Soil | Soil | Soil | Soil | Soil |
| Headspace Reading - ppm | PID | 8 | 17 | 17 | 41 | 2 |
| Volatile Organic Compounds (VOC) | EPA 8240 | | | | | |
| All Analytes - ppm | | - | ND | ND | ND | - |
| PCBs - ppm | EPA 8080 | - | - | - | ND | ND |
| Total Pet. Hydrocarbons (TPH) - ppm | EPA 418.1 | ND | 170 | 190 | 9,100 | ND |
| RCRA Total Metals | EPA 6010/7000 | | | | | |
| Arsenic - ppm | | - | ND | - | ND | - |
| Barium - ppm | | - | 100 | - | 78 | - |
| Cadmium - ppm | | - | ND | - | ND | - |
| Chromium - ppm | | - | 19 | - | 10 | - |
| Lead - ppm | | - | 11 | - | 81 | - |
| Mercury - ppm | | - | 0.05 | - | 0.037 | - |
| Selenium - ppm | | - | ND | - | ND | - |
| Silver - ppm | | - | ND | - | ND | - |

| KEY | DESCRIPTION |
|---|---|
| ND | BELOW METHOD DETECTION LIMIT (See Appendix A for Limits) |
| * | QC DUPLICATE |
| - | NOT TESTED |

## TABLE 2: ANALYTICAL RESULTS SUMMARY

| | | Sample Number (See Table 1 For Sample Loc.) | | | | |
|---|---|---|---|---|---|---|
| Parameter | Method | 06 | 07 | 08 | | |
| Matrix | | Oil | Sludge | Soil | | |
| Headspace Reading - ppm | PID | N/A | N/A | 723 | | |
| Aromatic Volatile Orgs. (BTEX) | EPA 8020 | | | | | |
| Benzene - ppm | | - | - | ND | | |
| Toluene - ppm | | - | - | ND | | |
| Ethylbenzene - ppm | | - | - | 0.13 | | |
| Total Xylenes - ppm | | - | - | 7.6 | | |
| Total BTEX - ppm | | - | - | 7.73 | | |
| Gasoline Range Orgs. (GRO) - ppm | EPA 8015M | - | - | 100 | | |
| Diesel Range Orgs. (DRO) - ppm | EPA 8100M | - | - | 65 | | |
| Flash Point - Deg. C | EPA 1010 | >100 | >100 | - | | |
| Total Halides - ppm | EPA 9076 | 1,300 | 33,000 | - | | |
| RCRA Total Metals - ppm | EPA 6010 | | | | | |
| Arsenic - ppm | | ND | ND | - | | |
| Cadmium - ppm | | ND | 1.5 | - | | |
| Chromium - ppm | | 0.92 | 12 | - | | |
| Lead - ppm | | 440 | 28,000 | - | | |
| PCBs - ppm | EPA 8080 | ND | ND | - | | |
| Halogenated Volatile Organics (HVO) | EPA 8010 | | | | | |
| Tetrachloroethene - ppm | | 20 | - | - | | |
| 1,1,1-Trichloroethane - ppm | | 18 | - | - | | |
| Remaining Analytes - ppm | | ND | - | - | | |
| TCLP Volatiles | EPA 1311/8240 | | | | | |
| Benzene - ppm | | 0.93 | - | - | | |
| Methyl ethyl ketone - ppm | | 0.68 | - | - | | |
| Remaining Analytes - ppm | | ND | - | - | | |

| KEY | DESCRIPTION |
|---|---|
| ND | BELOW METHOD DETECTION LIMIT (See Appendix A for Limits) |
| * | QC DUPLICATE |
| - | NOT TESTED |




LEGEND:

MW-1 — Approximate Location of Existing Monitoring Well

01 — Approximate Soil Sample Locatrion and Number

230 Old Steese Highway Site
Fairbanks, Alaska

SITE PLAN

X-0556-32 Aug 1994

SHANNON & WILSON, INC.
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Fig. 1

230 Old Steese Highway Site
Fairbanks, Alaska

**500-GALLON USED OIL TANK**

August 1994 X-0556-32

SHANNON & WILSON, INC.
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**FIG. 2**

Apendice G

NORTH CREEK ANALYTICAL

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NORTH CREEK ANALYTICAL

# BTEX - METHOD 8020 and TPH-G - ADEC CASE NARRATIVE

CLIENT: Shannon & Wilson
PROJECT #: X-556-6
PROJECT NAME: 230 OLD STEESE

## 1.0 DESCRIPTION OF CASE

One soil sample was analyzed for BTEX by EPA Method 8020 and TPH-G by ADEC methods.

## 2.0 COMMENTS ON ANALYSIS

**Analysis**
The sample was analyzed within method required hold times.

**Quantitation**
Trifluorobenzene has been added to each sample as an internal standard. All samples have been quantitated using an internal standard program. Peak height has been used for quantitation rather than peak area.

## 3.0 QC

All QC and surrogate results were within acceptable limits.

" I certify that this data package is in compliance with the methods listed above and guidelines in 18 AAC 78 both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature."

Dennis D. Wells, QA Director

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# EXTRACTABLE PETROLEUM HYDROCARBONS ALASKA TPH-D METHOD EPA 8100 mod CASE NARRATIVE

CLIENT: Shannon Stowell
PROJECT #: X-556-6
PROJECT NAME: 230 OLD STEESE

## 1.0 DESCRIPTION OF CASE

One soil sample was analyzed for extractable petroleum hydrocarbons by EPA 8100 mod.

## 2.0 COMMENTS ON ANALYSIS

**Analysis**

Samples were extracted within EPA recommended hold time. There were no problems encountered in the analysis.

## 3.0 QC

All QC results were within acceptable limits.

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# TOTAL RECOVERABLE PETROLEUM HYDROCARBONS METHOD- EPA 418.1 CASE NARRATIVE

CLIENT: Shannon & Wilson
PROJECT #: X-556-6
PROJECT NAME: 230 OLD STEESE

## 1.0 DESCRIPTION OF CASE

Five soil samples were analyzed for total recoverable petroleum hydrocarbons by EPA Method 418.1.

## 2.0 COMMENTS ON ANALYSIS

**Analysis**

All samples were analyzed within method required hold times. There were no problems encountered in the analyses.

## 3.0 QC

All QC results were within acceptable limits.

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NORTH CREEK ANALYTICAL

# VOLATILE HYDROCARBONS METHOD 8240 CASE NARRATIVE

CLIENT: Shannon & Wilson
PROJECT #: X-556-6
PROJECT NAME: 230 OLD STEESE

## 1.0 DESCRIPTION OF CASE

Three soil samples were analyzed for Volatile Hydrocarbons by EPA Method 8240.

## 2.0 COMMENTS ON ANALYSIS

**Analysis**
The samples were analyzed within method required hold times.

**Quantitation**
All samples have been quantitated using an internal standard program. Peak height has been used for quantitation rather than peak area.

## 3.0 QC

All QC results were within acceptable limits except for a slightly high recovery for 1,1-DCE (95% with an upper control limit of 87%). This higher recovery also threw the %RPD up to 15% (with a max of 10%).

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NORTH CREEK ANALYTICAL

# PCB's - METHOD 8080
# CASE NARRATIVE

CLIENT: Shannon & Wilson
PROJECT #: X-566-6
PROJECT NAME: 230 OLD STEESE

## 1.0 DESCRIPTION OF CASE

Two soil samples, one sludge sample and one oil sample were analyzed for PCB's by EPA Method 8081.

## 2.0 COMMENTS ON ANALYSIS

**Analysis**
All samples were analyzed within method required hold times.

## 3.0 QC

All QC results for the oil and soil samples were within acceptable limits, however, QC data could not be calculated for the sludge sample due to matrix interference.

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Dennis D. Wells ,QA Director

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NORTH CREEK ANALYTICAL

# METALS
# EPA METHOD 6010/7471 mod
# CASE NARRATIVE

CLIENT: Shannon & Wilson
PROJECT #: X-556-6
PROJECT NAME: 230 OLD STEESE

## 1.0 DESCRIPTION OF CASE

Two soil samples were analyzed for the eight RCRA metals, and two samples (1 oil, 1 sludge) were analyzed for lead, arsenic and chromium, and cadmium by EPA Method 6010. EPA method 7471mod was used to analyze the mercury in the two soil samples

## 2.0 COMMENTS ON ANALYSIS

**Analysis**

All samples were digested and analyzed within method required hold times. There were no problems encountered in these analyses.

## 3.0 QC

All QC results for this analytical batch were within acceptable limits, except the spike recovery for mercury, which was slightly low.

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Dennis D. Wells, QA Director

## READ RESPONSIBILITY CLAUSES CAREFULLY.

Because environmental site assessments/evaluations are based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against geotechnical/environmental consultants. To help prevent this problem, geotechnical/civil engineers and/or scientists have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the engineer's or scientist's liabilities to other parties; rather, they are definitive clauses that identify where responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses may appear in this report, and you are encouraged to read them closely. Your engineer/scientist will be pleased to give full and frank answers to your questions.

Consulting engineers/scientists cannot accept responsibility for problems that may develop if they are not consulted after factors considered in their reports have changed. Therefore, it is incumbent upon you to notify your engineer/scientist of any factors that may have changed prior to submission of our final assessment/evaluation.

An assessment/evaluation of a site helps reduce your risk, but does not eliminate it. Even the most rigorous professional assessment may fail to identify all existing conditions.

## ONE OF THE OBLIGATIONS OF YOUR CONSULTING ENGINEER/SCIENTIST IS TO PROTECT THE SAFETY, HEALTH, PROPERTY, AND WELFARE OF THE PUBLIC.

If our environmental site assessment/evaluation discloses the existence of conditions that may endanger the safety, health, property, or welfare of the public, we may be obligated (under rules of professional conduct, statutory law, or common law) to notify you and others of these conditions.