Underground Storage Tank (UST) Closure Assessment Garretts Tesoro 724 West International Airport Road Anchorage, Alaska

February, 1994

L20.01

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1.0 INTRODUCTION

This report presents the results of field and laboratory work in support of our Tank Closure Assessment performed for the removal of two underground storage tanks (USTs) at Garrett's Tesoro, 724 W. International Airport Road, Anchorage, Alaska. The USTs removed during this work effort were each 12,000 gallons in volume and stored regular and unleaded gasoline fuel. Presented in this report are our observations on-site with respect to removal of the USTs and potentially tainted soils, our field evaluation or "screening" of soils, analytical sampling activities, the results of screening and laboratory analyses, and characterization of the subsurface conditions and extent of petroleum hydrocarbon impact to the soils. This report also characterizes the soils that were removed from the former UST excavation and replaced as backfill. A small portion of these soils were thermally treated and properly disposed of following ADEC guidelines.

Our services for this UST closure work were performed in conjunction with installing a soil vapor extraction and groundwater remediation system. This installation provides for soil remediation at the site of the diesel UST removed in October, 1992, soil remediation at the site of the former two (2) gasoline USTs, and future groundwater treatment of the affected areas with a combined vapor extraction/water pump and treat system. Plan approval and authorization to proceed with this project were received from ADEC's representative, Mr. Robert Weimer, and the owner, Mr. Nelson Garrett, respectively.

2.0 SITE AND PROJECT DESCRIPTION

The project site is located at the southeast corner of Arctic Boulevard and International Airport Road in Anchorage, Alaska. More specifically, the site is situated in the Northwest 1/4 of the Southwest 1/4, Section 31, Township 13 North, Range 3 West, Seward Meridian. The legal description is Lot 17 of Campbell Park Acres Subdivision. The Alaska Department of Environmental Conservation (ADEC) has designated the site as Spill Number 90-2-1-0-010-1, File Number L20.01. The general site features in the immediate vicinity of the underground storage tank locations are shown in Figure 1.

This effort consisted of removing of two (2) gasoline fuel USTs installed in 1973 by Tesoro, Alaska. Shannon & Wilson was retained to monitor the tank removals, screen the soils exposed in the UST excavation bottom and sidewalls, screen and sample the soils during tank and dispenser excavations, and coordinate with the analytical laboratory for testing of both excavated and in-situ soils. BC Excavating was subcontracted to provide the personnel and equipment for the actual UST removal and disposal, while laboratory support services were provided by Commercial Testing and Engineering.

3.0 FIELD ACTIVITIES

3.1 Underground Storage Tank Removal Monitoring

The work effort described in this report consisted of removing two gasoline USTs and collecting soil samples to characterize the hydrocarbon impact to the ground from potential past fuel releases. The general features in the vicinity of these two former USTs, designated 1 and 2, are shown in Figures 1 and 2.

On June 2, 1993, a representative of Shannon & Wilson met with BC Excavating to begin removal activities of the USTs and associated piping. The tank and piping removal was performed in accordance with the American Petroleum Institute (API) Recommended Practice 1604 and following monitoring procedures set forth in Shannon & Wilson's QAPP approved by ADEC on April 23, 1991. BC Excavating used an EX 2000 backhoe to excavate the soil surrounding the USTs and lift the USTs from the excavation. Specially designed roof canopy supports were constructed by BC Excavating to provide temporary building and roof support during the UST removal and remediation system installation. All buried public utilities were located prior to tank excavation activities.

The long axes of the USTs were oriented in the northwest-southeast direction as shown in Figure 2. Prior to tank excavation, the ground surface above the tanks was covered with concrete and asphalt pavement. After the tanks were exposed, we could see that the product feed lines were connected on the northwest side of each tank and continued underground to the pump dispensers at the three pump islands shown in Figure 2. Soil excavated from the dispenser and tank locations was temporarily stored in a temporary stockpile on-site on a paved asphalt surface and covered

with a reinforced plastic membrane. This excavated soil was subsequently placed as backfill material into the UST excavation for remediation by the planned on-site treatment system.

Tank No. 1 was taken out of service in January, 1989, after tightness testing indicated that there was a leak in the piping. Tank No. 2 was kept active until it was removed. Before removing the tanks, residual product was pumped from them by the owner. The concrete and asphalt pavement covering the two tanks was then removed on June 2, 3 and 4, 1993. Tank No. 1 was removed on June 4, 1993, while Tank No. 2 was removed the next day. Dispensers from Pump Island No. 1, directly above the tanks, were removed on June 2 and 3, 1993, at the same time as the surrounding pavement. Dispensers from Pump Island Nos. 2 and 3 were removed on June 8, 1993, shortly after the tanks were taken out. In support of this construction effort, Shannon & Wilson performed the tank removal monitoring, soil screening, excavation soil logging, and collection of analytical soils for testing. After the tanks were uncovered, they were lifted from their excavation and placed on the adjacent asphalt parking lot area for inspection and preparation for disposal. Both tanks measured 25 feet in length and 9 feet wide. No holes or heavy corrosion were observed on either tank. Preparation for disposal consisted of purging the tank with compressed air, cutting holes in the tank ends, and cleaning sludge from the interior tank bottom with sorbent pads. The sludge and sorbent pads were placed in lidded 55 gallon drums and disposed of by BC Excavating. The tank and steel piping were disposed of at Alaska Metal and Recycling in Anchorage.

With the tanks side by side, one large excavation was completed to remove the two tanks. The surface dimensions of the excavation were about 43 feet by 37 feet, or roughly 1,600 square feet. It also had a depth ranging from sixteen to twenty-two feet below ground surface. The crowns of the 9-foot diameter tanks were roughly 4.5 feet below the ground surface. Using an EX 2000 backhoe, the excavation was continued below the bottom of the tanks until groundwater was encountered. Saturated soils were encountered about 22 feet below the ground surface. See Figure 3 for a cross-section of the soils exposed in the excavation sidewalls.

As a part of tank removal activities, the three pump islands shown in Figure 2 and associated dispensers were removed. To document conditions in these areas, headspace soil samples and companion analytical samples were collected from under the three pump islands from ten (10) fueling dispenser locations. The dispenser and sampling locations on each island are shown on Figure 2.

During the tank removals, soil samples were collected from the excavation bottom and sidewalls of each of the two tanks to assess the levels of gasoline petroleum hydrocarbons. The soil removed from around the USTs was used as backfill for the excavation, with the exception of the trench area where vapor extraction system piping was installed over the Tank No. 1 footprint The location of this and other vapor extraction piping is shown in Figure 2. This specially designed trench was filled with 6 to 8 inches of pea gravel for a 2 to 3 foot zone about 5 to 6 feet below the ground surface. A 4-inch diameter PVC clotted pipe was placed in the pea gravel trench zone at a depth of about 4 to 5 feet below ground surface. Pea gravel was backfilled to a depth of about 3 feet below ground surface, and the remainder of the excavation was backfilled with more impervious soils which had been removed during the tank removals. All excavation backfill was densely compacted as a part of site restoration.

3.2 Screening and Sampling

The soil in the UST excavation and the excavated soil were evaluated or "screened" for volatile organics using a Thermo Environmental Instruments OVM 580B photoionization detector (PID) calibrated with an isobutylene standard gas. The PID was used to sample the vapors released by soil samples using headspace screening methods. The location and description of headspace sampling sites in the excavation are summarized on Table 1.

A total of seventeen (17) headspace samples were screened with the PID. These samples were taken at a depth of about 1 to 2 feet below each dispenser, and in the excavation bottom and sidewalls and from within the soil stockpile, as designated on Table 1 and in Figure 2. Headspace samples were collected in 8 oz. glass jars by filling these containers with freshly exposed soils to one-half its volume using a stainless steel spoon and then sealing the top. The stainless steel spoon was cleaned prior to taking a headspace sample by washing in an anionic liquid detergent solution, followed by two tap water rinses, methanol rinse, and a final deionized water rinse. After collecting the headspace samples from the excavation, the samples were allowed to equilibrate to approximately 65°F and agitated for about 15 seconds before screening with the PID in an environment free of petroleum hydrocarbon vapors. Screening was accomplished by inserting the PID sampling probe into the air space above the soil through a hole punctured in the lid of the sample jar. The PID display was observed and the maximum reading was recorded for each sample. The results of PID headspace readings for each sample are presented in Table 2.

Analytical samples were collected in a manner similar to headspace samples. The 8 oz. glass analytical jars were filled with soil as completely as possible before being sealed with teflon lined lids. The soil sample jars were placed in a cooler for delivery to the laboratory under chain-of-custody procedures. Sampling was accomplished by an experienced geologist using Level D personnel protection. Figure 2 shows the plan view location of each sample submitted for analyses. Table 1 describes the location of all sampling sites in the excavation and from the excavated soil.

For the UST and soil removal monitoring, seventeen (17) discrete soil samples were taken from the dispenser and UST excavation. A total of six soil samples, or three from the most visibly stained areas underneath the each of the two tanks were submitted for analysis. The samples collected were designated Samples S5, S6 and S7 for Tank No. 1, and were collected from the west end, the north center wall, and east end under the tank fill pipe, respectively (see Figure 2). Samples S8, S9, S10 and S11 were collected from under Tank No. 2 at the west end of the excavation, the tank center and east end of the excavation, respectively. The sample locations are shown in Figure 2.

For the dispenser excavations, Samples S1 through S4 and S12 through S17 were collected from 1 to 2 feet beneath the pipe connection to the dispenser. Sample locations included all current and former dispenser pipe connections. Sample S4 in Figure 2 was collected from a former dispenser location. Although there was no existing dispenser at the island at S4 at the time of removal, ground piping at this locations indicated that a dispenser had existed here in the past.

Since an in-place soil and groundwater remediation system was installed at this location during June through December, 1993, samples from the excavated soils used as backfill material were not analyzed. Subsurface soils had been characterized in detail in previous soil and groundwater assessment phases of this project, and all information has been submitted to the ADEC for review.

4.0 LABORATORY ANALYSES

The soil samples collected from the dispenser areas and designated Samples S1, S2, S3, S4, S12, S14, S15, S16 and S17, were analyzed for gasoline range organics by EPA Method 5030/8015 Modified. The soil samples with the highest PID readings or most visibly stained soils, Samples S1, S2, S3, S4, S12 and S15, were also analyzed for aromatic volatile organics (BTEX)

by EPA Method 8020. Soil Sample S1, registering the highest headspace reading, was also tested for total lead by EPA Method 7421.

Four soil samples from the UST excavation, Samples S5, S6 from Tank No. 1, and Samples S8 and S9 from Tank No. 2, were analyzed for gasoline range organics by EPA Method 5030/8015M. The soil sample with the most visibly stained soils, Sample S9, was additionally analyzed for aromatic volatile organics (BTEX) by EPA Method 8020.

All samples were delivered to the laboratory under chain-of-custody procedures and analyzed by Chemical & Geological Laboratory, Inc. of Anchorage, Alaska, on a two week turn around basis. A Level I Data Package for laboratory quality control verification was requested for the laboratory analyses. The results of the analyses are summarized in Table 2 and the laboratory reports are presented in Appendix A.

5.0 SUBSURFACE CONDITIONS

5.1 Soils

The ground surface at this gas station was paved with several inches of asphalt and concrete. As shown in Figure 3, the soil encountered below the pavement consisted of a coarse, sandy gravel fill material from the surface to approximately 3 feet below the surface. Underlying the sandy gravel was a silty, sandy gravel to about 8 feet below the surface. Below this unit, a light brown silt was encountered to a depth of about 11 feet, followed by a gray to brown sand to about 22 feet, or the bottom of the excavation. The lower sand unit possessed a noticeable petroleum aroma.

5.2 Groundwater

Groundwater was encountered in the UST excavation bottom at a depth of about 22 feet below the ground surface. Measurements taken from existing monitoring wells on the site from prior studies indicate that the static groundwater level is about 17 feet below the surface. Quarterly groundwater measurements during 1991 and 1992, indicated that the direction of groundwater flow varied between a northerly to an easterly direction at a gradient of 0.35 to 1.5%. This general flow direction is shown at the top of Figure 1.

6.0 DISCUSSION OF ANALYTICAL RESULTS

In order to establish the appropriate cleanup level for this site, the ADEC Matrix Score Sheet was filled out. This scoring, shown in Table 3, depicts a matrix score of 43 which according to the bottom of Table 3 required a Level A cleanup for the soil or the following minimum cleanup standards:

For gasoline range organics (GRO)	50 ppm
For benzene	0.1 ppm
For BTEX	10 ppm

From the PID headspace screening and analytical laboratory results in Table 2, elevated levels of gasoline range organics (GRO) and aromatic volatile organics (BTEX) were present in both the tank excavation and under the dispensers. These results are discussed below in greater detail.

6.1 UST Excavation

GRO and aromatic volatile organics were detected in all four (4) samples tested from the excavation. Samples S5 and S6 from near Tank No. 1 had GRO concentrations of 1160 ppm and 2490 ppm, respectively. Sample S5 also had a total BTEX concentration of 219 ppm with 2.17 ppm benzene. Sample S6 had a total BTEX concentration of 501 ppm with 3.81 ppm benzene. All of the values exceed the above minimum ADEC cleanup standards.

Samples S8 and S9 from near Tank No. 2 had GRO concentrations of 3310 ppm and 4010 ppm, respectively. Sample S9 also had a total BTEX concentration of 923 ppm with 6.81 ppm benzene. These samples also all exceed the above ADEC Level A criteria.

6.2 Pump Island Excavations

The soil samples S1 through S4 from under Pump Island No. 1 had GRO levels of 5200 ppm, 2830 ppm, 213 ppm and 614 ppm, respectively. Sample S1 had a total BTEX concentration of 1543 ppm with 1.9 ppm benzene and 85 ppm lead, while Sample S2 had a total BTEX concentration of 467 ppm with 1.97 ppm benzene. Sample S3 had a total BTEX concentration of 43 ppm with 0.137 ppm benzene, while Sample S4 had a total BTEX concentration of 62 ppm

with 0.2 ppm benzene. All of the tests show results in excess of the above ADEC cleanup standards.

Soil sample S12, from under Pump Island No. 2, had concentrations of 40 ppm GRO and 13 ppm total BTEX, with 0.2 ppm benzene. Similarly, soil sample S15, from under Pump Island No. 3, had 1620 ppm GRO and 295 ppm total BTEX, with 0.2 ppm benzene, while Samples S14, S16 and S17 had GRO levels of 1030 ppm, 700 ppm and 1110 ppm, respectively. With the exception of the GRO results in S12, these results are consistently above ADEC cleanup standards. Even S12 failed the criteria as both benzene and total BTEX were excessive.

6.3 Quality Control

A Level I Data Package was requested from the laboratory for samples taken from the UST and dispenser excavations. This Data Deliverables package was used to determine 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, completeness, and the data quality objectives (DQO) for gasoline range organics (GRO), aromatic volatile organics (BTEX) and total lead for this project are as follows:

Parameter	Precision (DQO)%	Accuracy (DQO)%	Completeness (DQO)%
GRO	+/- 7 (+/-40)	91-116 (60-130)	100 (95)
BTEX	+/- 13 (+/-40)	94-104 (60-130)	100 (95)
Total Lead	+/- 10 (+/-40)	95 (60-130)	100 (95)

As shown above, the DQOs for this project have been met.

7.0 CONCLUSION AND RECOMMENDATIONS

Based on the data presented herein, almost all the soil samples analyzed from the UST and dispenser excavations exceeded the ADEC Level A soil cleanup guidelines for GRO, benzene and total BTEX. GRO concentrations ranging from 40 ppm to 5200 ppm indicate that gasoline product

is present in much of the soil around the dispensers and former tank locations. Benzene was also detected in the soil at concentrations of 0.137 ppm to 6.81 ppm, while total BTEX levels ranged from 13 ppm to 1542 ppm.

For this UST closure assessment, a soil sample from the saturated zone just below the groundwater table was not analyzed because a previous study in November, 1991, already determined that the groundwater contained concentrations of TPH and benzene exceeding ADEC maximum contaminant levels (MCL).

As part of the remediation effort for this site, a feasibility study for an in-situ vapor extraction system was conducted in the fall of 1991 by Shannon & Wilson. Figure 1 shows this system which, when operated, will treat the contaminated soils associated with the two gasoline tanks as well as a diesel tank removed in October, 1992.

We have performed the above described sampling and testing procedures in accordance with the ADEC UST Regulations concerning site assessments during an UST Closure. We recommend that you follow the UST Regulations and submit a copy of this report to the ADEC for their review.

8.0 CLOSURE/LIMITATIONS

This report was prepared for the exclusive use of our client and his 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. 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 judgment 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 will 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.

Shannon & Wilson has prepared the attachments in Appendix B "Important Information About Your Geotechnical Engineering/Subsurface Waste Management Report" to assist you and other in understanding the use and limitations of our reports.

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:

Susan Guhl By TMT
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TMT/mac

Approved By:

Fred R. Brown
Fred R. Brown, P.E.
Vice President

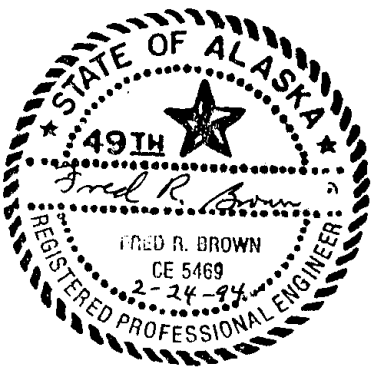


TABLE 1 - SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location (See also Table 2 and Figures 1 & 2)	Approx. Depth (Ft.)	Sample Classification
S1	6/3/93	Sample No. 1, 2' under dispenser 1, Pump Island No. 1	2	Brown, sandy GRAVEL, petroleum aroma
S2	6/3/93	Sample No. 2, 2' under dispenser 2, Pump Island No. 1	2	Brown, sandy GRAVEL, petroleum aroma
S3	6/3/93	Sample No. 3, 2' under dispenser 3, Pump Island No. 1	2	Brown, sandy GRAVEL, petroleum aroma
S4	6/3/93	Sample No. 4, 2' under dispenser 4, Pump Island No. 1	2	Brown, sandy GRAVEL, petroleum aroma
S5	6/4/93	Sample No. 5, below Tank No. 1, west end	16	Gray to brown, SAND, petroleum aroma
S6	6/4/93	Sample No. 6, below bottom of Tank No. 1, north center sidewall	16	Brown, slightly silty SAND, petroleum aroma
S7	6/4/93	Sample No. 7, below Tank No. 1, under fill pipe, east end	16	Gray to brown, sligtly silty,gravelly SAND, petroleum aroma
S8	6/5/93	Sample No. 8, below Tank No. 2, west end	16	Gray to brown SAND, petroleum aroma
S9	6/5/93	Sample No. 9, below Tank No. 2, center	16	Gray to brown SAND, petroleum aroma
S10	6/5/93	Sample No. 10, below Tank No. 2, east end	16	Gray to brown SAND, petroleum aroma
S11	6/5/93	Sample No. 11, below Tank No. 2, east end	22	Gray to brown SAND with traces of gray silt, petroleum aroma
S12	6/8/93	Sample No. 12, north of cashier bldg., under dispenser 5, Pump Island No. 2	2	Brown , sandy GRAVEL, dry, petroleum aroma
S13	6/8/93	Sample No. 13, south of cashier bldg., under dispenser 6, Pump Island No. 2	2	Brown , sandy GRAVEL, dry, petroleum aroma
S14	6/8/93	Sample No. 14, north, under dispenser 7, Pump Island No. 3	2	Brown , sandy GRAVEL, dry, petroleum aroma
S15	6/8/93	Sample No. 15, under dispenser 8, Pump Island No. 3	2	Brown , sandy GRAVEL, dry, petroleum aroma
S16	6/8/93	Sample No. 16, under dispenser 9, Pump Island No. 3	2	Brown , sandy GRAVEL, dry, petroleum aroma
S17	6/8/93	Sample No. 17, under dispenser 10, Pump Island No. 3	2	Brown , sandy GRAVEL, dry, petroleum aroma

TABLE 2 - SUMMARY OF HEADSPACE AND ANALYTICAL RESULTS

		Sample Number (See Table 1, Figures 1 & 2 and Appendix A)								
Parameter Tested	**Method***	S1	S2	S3	S4	S5	S6	S7	S8	S9
PID Headspace Reading - ppm	580B OVM	1300	687	8	323	530	477	119	482	387
Gasoline Range Organics (GRO) - ppm	EPA 5030/8015 M	5200	2830	213	614	1160	2490	NA	3310	4010
Aromatic Volatile Organics (BTEX)	EPA 8020									
Benzene - ppm	EPA 8020	ND	1.97	0.137	ND	2.17	3.81	NA	NA	6.81
Toluene - ppm	EPA 8020	157	59.9	5.25	0.437	34.3	76.0	NA	NA	40.7
Ethylbenzene - ppm	EPA 8020	119	34.6	4.79	0.832	7.16	17.0	NA	NA	3.4
O-Xylenes - ppm	EPA 8020	853	227	23.0	22.4	112	257	NA	NA	566
P&M-Xylenes - ppm	EPA 8020	412	144	10.2	38.3	64.1	147	NA	NA	306
Total BTEX - ppm	EPA 8020	1541	467.47	43.377	61.969	219.73	500.81	NA	NA	922.91
Total Lead - ppm	EPA 7421	85	NA	NA	NA	NA	NA	NA	NA	NA

		Sample Number (See Table 1, Figures 1 & 2 and Appendix A)								
Parameter Tested	**Method***	S10	S11	S12	S13	S14	S15	S16	S17	
PID Headspace Reading - ppm	580B OVM	433	472	321	4	546	633	565	405	
Gasoline Range Organics (GRO) - ppm	EPA 5030/8015 M	NA	NA	40.7	NA	1030	1620	700	1110	
Aromatic Volatile Organics (BTEX)	EPA 8020									
Benzene - ppm	EPA 8020	NA	NA	0.231	NA	NA	0.276	NA	NA	
Toluene - ppm	EPA 8020	NA	NA	2.36	NA	NA	13.0	NA	NA	
Ethylbenzene - ppm	EPA 8020	NA	NA	1.29	NA	NA	13.0	NA	NA	
O-Xylenes - ppm	EPA 8020	NA	NA	6.24	NA	NA	184	NA	NA	
P&M-Xylenes - ppm	EPA 8020	NA	NA	3.29	NA	NA	84.9	NA	NA	
Total BTEX - ppm	EPA 8020	NA	NA	13.411	NA	NA	295.176	NA	NA	
Total Lead - ppm	EPA 7421	NA	NA	NA	NA	NA	NA	NA	NA	

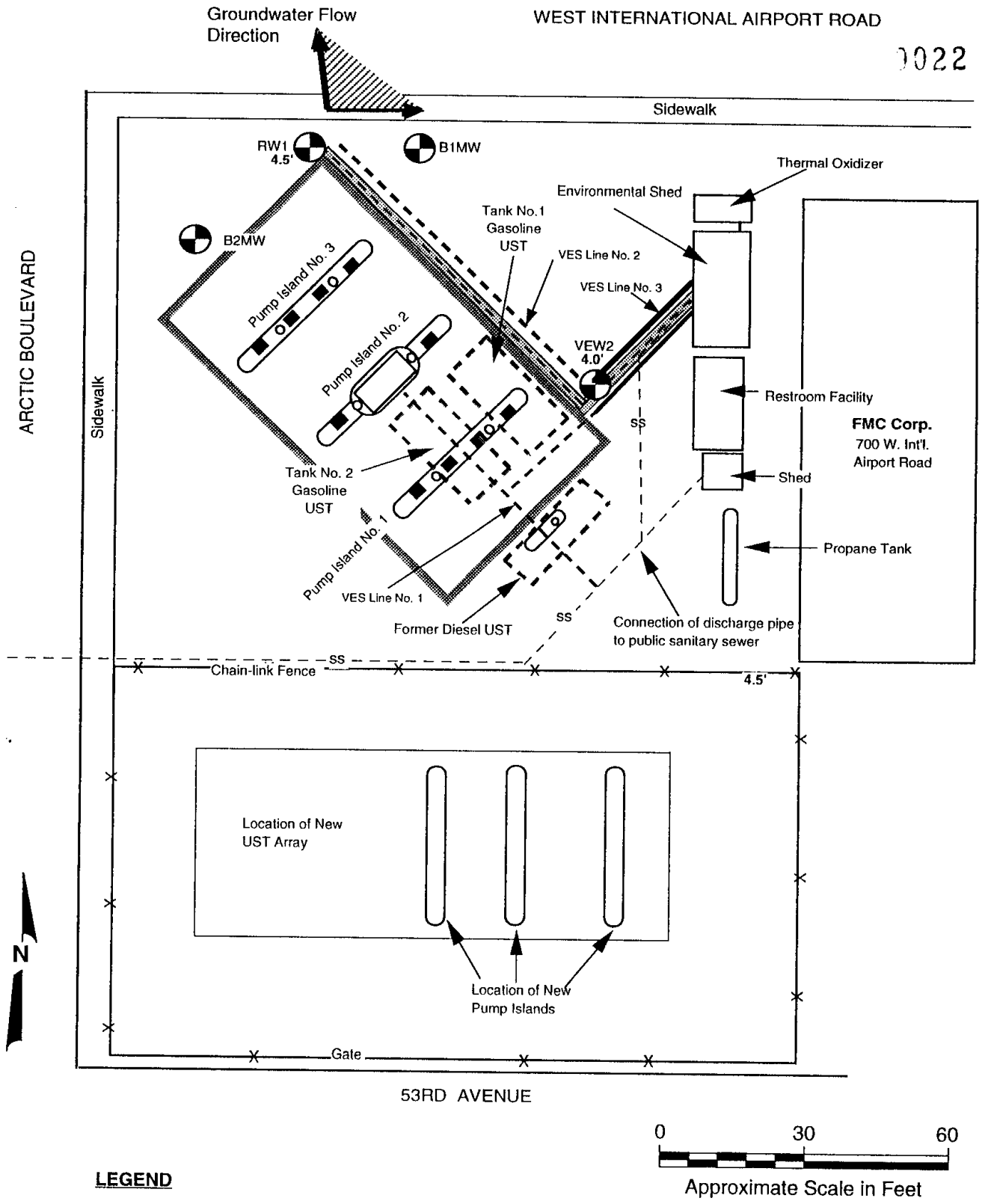
KEY	DESCRIPTION
NA	SAMPLE NOT ANALYZED FOR THIS PARAMETER
ND	NOT DETECTED
*	SEE APPENDIX A FOR LIMITS OF DETECTION AND ALL OTHER COMPOUNDS TESTED

0020

TABLE 3 - ADEC MATRIX SCORE SHEET

1. Depth to Subsurface Water		10
< 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)		8
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		12
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]	

Matrix Score 43	Cleanup Level in mg/kg			
	Diesel	Gasoline/unknown		
	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



LEGEND

- 4-inch 0.020" slot PVC pipe
- 4-inch HDPE Pipe
- 1.5-inch HDPE Water Line and 1.0-inch HDPE Product Recovery Line
- 4.0' — Trench depth, ft.
- B1MW — Existing monitoring and recovery wells or VES wells

724 West International Airport Road
Anchorage, Alaska

SITE PLAN

February, 1994 Y-204-3

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 1

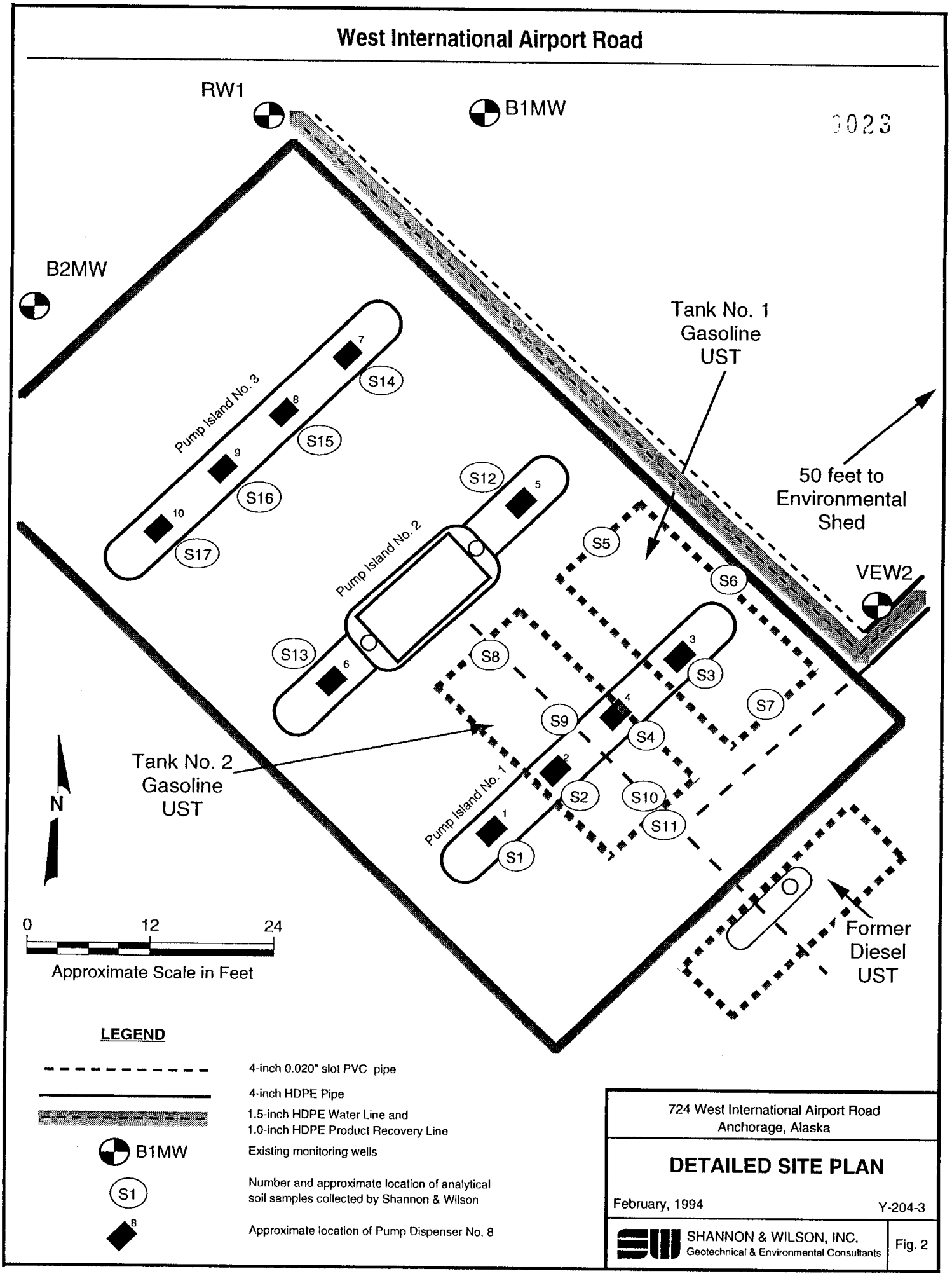

West International Airport Road
RW1
B1MW
B2MW
Tank No. 1
Gasoline
UST
50 feet to
Environmental
Shed
VEW2
Pump Island No. 3
Pump Island No. 2
Pump Island No. 1
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15
S16
S17
Tank No. 2
Gasoline
UST
N
0
12
24
Approximate Scale in Feet
Former
Diesel
UST
LEGEND
4-inch 0.020" slot PVC pipe
4-inch HDPE Pipe
1.5-inch HDPE Water Line and
1.0-inch HDPE Product Recovery Line
B1MW
Existing monitoring wells
S1
Number and approximate location of analytical
soil samples collected by Shannon & Wilson
Approximate location of Pump Dispenser No. 8
724 West International Airport Road
Anchorage, Alaska
DETAILED SITE PLAN
February, 1994
Y-204-3
SHANNON & WILSON, INC.
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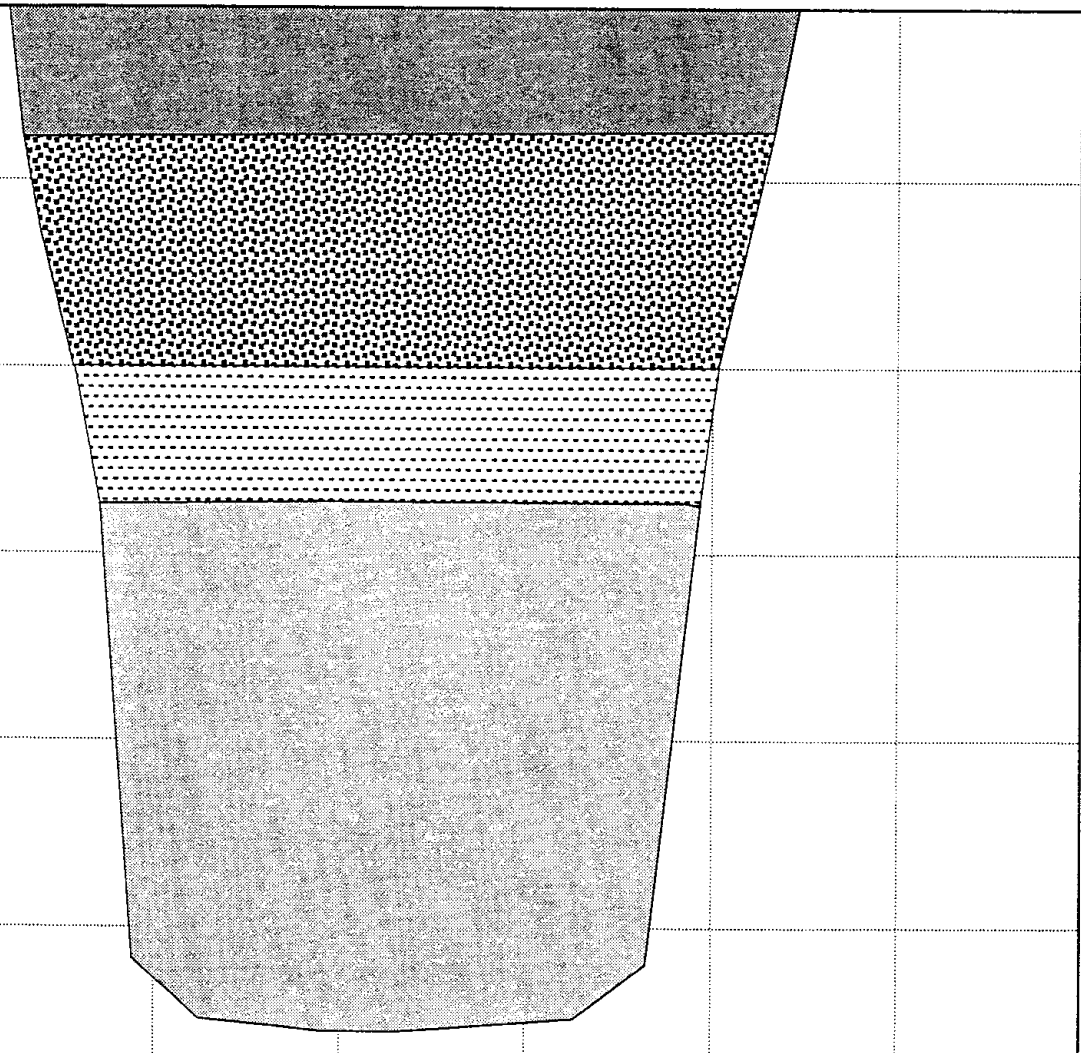
Fig. 2

Sketch of Northeast Wall at Tank No. 2 Surface Elevation: Approximately 106 ft.



Depth, Ft.	Ground Water	SOIL DESCRIPTION
0		
2		Coarse, sandy GRAVEL [FILL]
4		
6		Silty, sandy GRAVEL
8		
10		Light brown SILT
12		Gray to brown SAND; moist at 20'; hydrocarbon aroma
14		Bottom of Tank Nos. 1 and 2 at a depth of about 13.5 feet
16		Seasonal Groundwater Fluctuation Observed From About 17 to 22 feet Depth During Assessments Conducted by Shannon & Wilson From 1989 Through 1994
18		
20		Bottom of Excavation Completed June 5, 1993
22		
24		

4024

724 West International Airport Road
Anchorage, Alaska

Cross Section of Northeast Wall of Excavation at Tank No. 2

February,1994 Y-204-3

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 3

APPENDIX A

RESULTS OF ANALYTICAL TESTING PERFORMED BY CHEMICAL AND GEOLOGICAL LABORATORY, INC. OF ALASKA

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :93.2588-1
Client Sample ID :Y-204-3-S1
Matrix :SOIL

0026

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :66898
Report Completed :06/16/93
Collected :06/03/93 @ 15:10 hrs.
Received :06/05/93 @ 09:15 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. PROJECT #Y-204-3. GARRETT'S.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Sample Preparation	---			EPA 3050 Digest				
Lead	85		mg/Kg	EPA 7421 GF		06/15	06/16	KAW
Percent Solids	95.9		%	SM17 2540G			06/08	WLS
Hydrocarbons VPH	5200	D	mg/Kg	EPA 5030/8015M		06/08	06/10	WLS
Aromatics-BTEX				ADEC 18AAC 78				
Benzene	1.90	U	mg/Kg	EPA 8020		06/08	06/09	WLS
Toluene	157	D	mg/Kg	EPA 8020		06/08	06/10	WLS
Ethylbenzene	119	D	mg/Kg	EPA 8020		06/08	06/10	WLS
p&m Xylene	853	D	mg/Kg	EPA 8020		06/08	06/10	WLS
o-Xylene	412	D	mg/Kg	EPA 8020		06/08	06/10	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
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ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

0027

Chemlab Ref.# :93.2588-2
Client Sample ID :Y-204-3-S2
Matrix :SOIL

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :66898
Report Completed :06/16/93
Collected :06/03/93 @ 15:20 hrs.
Received :06/05/93 @ 09:15 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. PROJECT #Y-204-3. GARRETT'S.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	95.2		%	SM17 2540G		06/08	06/08	WLS
Hydrocarbons VPH	2830	D	mg/Kg	EPA 5030/8015M		06/08	06/10	WLS
Aromatics-BTEX				ADEC 18AAC 78				
Benzene	1.97	D	mg/Kg	EPA 8020		06/08	06/09	WLS
Toluene	59.9	D	mg/Kg	EPA 8020		06/08	06/10	WLS
Ethylbenzene	34.6	D	mg/Kg	EPA 8020		06/08	06/10	WLS
p&m Xylene	227	D	mg/Kg	EPA 8020		06/08	06/10	WLS
o-Xylene	144	D	mg/Kg	EPA 8020		06/08	06/10	WLS

* See Special Instructions Above
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UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

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ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

0028

Chemlab Ref.# :93.2588-3
Client Sample ID :Y-204-3-S3
Matrix :SOIL

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :66898
Report Completed :06/16/93
Collected :06/03/93 @ 16:00 hrs.
Received :06/05/93 @ 09:15 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. PROJECT #Y-204-3. GARRETT'S.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	94.5		%	SM17 2540G		06/08	06/08	WLS
Hydrocarbons VPH	213	D	mg/Kg	EPA 5030/8015M		06/08	06/11	WLS
Aromatics-BTEX				ADEC 18AAC 78				
Benzene	0.137		mg/Kg	EPA 8020		06/08	06/11	WLS
Toluene	5.25	D	mg/Kg	EPA 8020		06/08	06/11	WLS
Ethylbenzene	4.79	D	mg/Kg	EPA 8020		06/08	06/11	WLS
p&m Xylene	23.0	D	mg/Kg	EPA 8020		06/08	06/11	WLS
o-Xylene	10.2	D	mg/Kg	EPA 8020		06/08	06/11	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

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FAX: (907) 561-5301

REPORT of ANALYSIS

)029

Chemlab Ref.# :93.2588-4
Client Sample ID :Y-204-3-S4
Matrix :SOIL

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :66898
Report Completed :06/16/93
Collected :06/03/93 @ 16:30 hrs.
Received :06/05/93 @ 09:15 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. PROJECT #Y-204-3. GARRETT'S.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	96.5		%	SM17 2540G		06/08	06/08	WLS
Hydrocarbons VPH	614	D	mg/Kg	EPA 5030/8015M		06/08	06/11	WLS
Aromatics-BTEX				ADEC 18AAC 78				
Benzene	0.200	U	mg/Kg	EPA 8020		06/08	06/09	WLS
Toluene	0.437	D	mg/Kg	EPA 8020		06/08	06/09	WLS
Ethylbenzene	0.832	D	mg/Kg	EPA 8020		06/08	06/09	WLS
p&m Xylene	22.4	D	mg/Kg	EPA 8020		06/08	06/09	WLS
o-Xylene	38.3	D	mg/Kg	EPA 8020		06/08	06/09	WLS

* See Special Instructions Above
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D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

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5633 B STREET
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FAX: (907) 561-5301

REPORT of ANALYSIS

)030

Chemlab Ref.# :93.2588-5
Client Sample ID :Y-204-3-S5
Matrix :SOIL

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :66898
Report Completed :06/16/93
Collected :06/03/93 @ 15:30 hrs.
Received :06/05/93 @ 09:15 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. PROJECT #Y-204-3. GARRETT'S.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	94.4		%	SM17 2540G		06/08	06/08	WLS
Hydrocarbons VPH	1160	D	mg/Kg	EPA 5030/8015M		06/08	06/11	WLS
Aromatics-BTEX				ADEC 18AAC 78				
Benzene	2.17	D	mg/Kg	EPA 8020		06/08	06/11	WLS
Toluene	34.3	D	mg/Kg	EPA 8020		06/08	06/11	WLS
Ethylbenzene	7.16	D	mg/Kg	EPA 8020		06/08	06/11	WLS
p&m Xylene	112	D	mg/Kg	EPA 8020		06/08	06/11	WLS
o-Xylene	64.1	D	mg/Kg	EPA 8020		06/08	06/11	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

0031

Chemlab Ref.# :93.2588-6
Client Sample ID :Y-204-3-S6
Matrix :SOIL

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :66898
Report Completed :06/16/93
Collected :06/03/93 @ 16:00 hrs.
Received :06/05/93 @ 09:15 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. PROJECT #Y-204-3. GARRETT'S.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	93.0		%	SM17 2540G		06/08	06/08	WLS
Hydrocarbons VPH	2490	D	mg/Kg	EPA 5030/8015M		06/08	06/09	WLS
Aromatics-BTEX				ADEC 18AAC 78				
Benzene	3.81	D	mg/Kg	EPA 8020		06/08	06/09	WLS
Toluene	76.0	D	mg/Kg	EPA 8020		06/08	06/09	WLS
Ethylbenzene	17.0	D	mg/Kg	EPA 8020		06/08	06/09	WLS
p&m Xylene	257	D	mg/Kg	EPA 8020		06/08	06/09	WLS
o-Xylene	147	D	mg/Kg	EPA 8020		06/08	06/09	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Chain of Custody Record

Shannon & Wilson, Inc.

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Laboratory Chem & G

Attn:

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 503/8015 GRO	EPA 8020 BTEX	EPA 7421 Total lead					Total Number of Containers	Remarks/Matrix
(1) Y-204-3-S1		3:10	6/3/93		✓	X	X	X					1	Soil
(2) Y-204-3-S2		3:20	6/3/93		✓	X	X						1	"
(3) Y-204-3-S3		4:00	6/3/93		✓	X	X						1	"
(4) Y-204-3-S4		4:30	6/3/93		✓	X	X						1	↓
(5) Y-204-3-S5		3:30	6/4/93		✓	X	X						2	Soil
(6) Y-204-3-S6		4:00	6/4/93		✓	X	X						2	↓

Project Information	Sample Receipt
Project Number: Y-204-3	Total Number of Containers
Project Name: Exxon #3	COC Seals/Intact Y/N/NA
Contact: Susan Guhl	Received Good Cond./Cold
Ongoing Project? Yes ☐ No ☐	Delivery Method:
Sampler: Susan Guhl	(attached shipping bill, if any)

Instructions
Requested Turn Around Time: Regular
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan L Guhl Time: 9:15	Signature: Time:	Signature: Time:
Printed Name: SUSAN L GUHL Date: 6/5/93	Printed Name: Date:	Printed Name: Date:
Company: SHANNON & WILSON	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 7:15	Signature: Time:	Signature: Time:
Printed Name: Date: 6/5/93	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

1032

COMMERCIAL TESTING & ENGINEERING CO. 0033
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.2590-1
Client Sample ID :Y-204-3-S8
Matrix :SOIL

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S TESORO
Project# :Y-204-3
PWSID :UA

WORK Order :66906
Report Completed :06/11/93
Collected :06/05/93 @ 12:10 hrs.
Received :06/07/93 @ 08:20 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. PROJECT #Y-204-3. GARRETT'S TESORO.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	80.6		%	SM17 2540G			06/08	WLS
Hydrocarbons VPH	3310	D	mg/Kg	EPA 5030/8015M		06/08	06/10	WLS

* See Special Instructions Above
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LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

0034

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.2590-2
Client Sample ID :Y-204-3-S11
Matrix :SOIL

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S TESORO
Project# :Y-204-3
PWSID :UA

WORK Order :66906
Report Completed :06/11/93
Collected :06/05/93 @ 12:30 hrs.
Received :06/07/93 @ 08:20 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. PROJECT #Y-204-3. GARRETT'S TESORO.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	92.3		%	SM17 2540G			06/08	WLS
Hydrocarbons VPH	4010	D	mg/Kg	EPA 5030/8015M		06/08	06/10	WLS
Aromatics-BTEX				ADEC 18AAC 78				
BENZENE	6.81	D	mg/Kg	EPA 8020		06/08	06/09	WLS
TOLUENE	40.7	D	mg/Kg	EPA 8020		06/08	06/09	WLS
ETHYLBENZENE	3.40	D	mg/Kg	EPA 8020		06/08	06/09	WLS
p&m XYLENE	566	D	mg/Kg	EPA 8020		06/08	06/10	WLS
o-XYLENE	306	D	mg/Kg	EPA 8020		06/08	06/10	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.
UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

Chain of Custody Record

Page _____ of _____

Laboratory _____

Attn: _____

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 5030/8015 GRO	EPA 8020 BTEX						Total Number of Containers	Remarks/Matrix
(1)	Y-204-3-58	✓	12:10	6/5/93		✓	X							2	SOIL
(2)	Y-204-3-511	✓	12:30	6/5/93		✓	X	X						2	SOIL

Project Information	Sample Receipt
Project Number: Y-204-3	Total Number of Containers
Project Name: Garrison Tract	COC Seals/Intact Y/N/NA
Contact: Susan Guhl	Received Good Cond./Cold
Ongoing Project? Yes ☒ No ☐	Delivery Method:
Sampler: Susan Guhl	(attached shipping bill, if any)

Instructions

Requested Turn Around Time: Regular

Special Instructions:

4.1°C

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan L Guhl Time: 0820	Signature: Time:	Signature: Time:
Printed Name: SUSAN L GUHL Date: 6/7/93	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 0820	Signature: Time:	Signature: Time:
Printed Name: Date: 6/7/93	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

0036

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.2647-1
Client Sample ID :Y-204-3-S12
Matrix :SOIL

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S TESORO
Project# :Y-204-3
PWSID :UA

WORK Order :67049
Report Completed :06/16/93
Collected :06/08/93 @ 15:00 hrs.
Received :06/09/93 @ 09:20 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. PROJECT #Y-204-3. GARRETT'S TESORO.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	97.7		%	SM17 2540G			06/10	JME
Hydrocarbons VPH	40.7	D	mg/Kg	EPA 5030/8015M		06/10	06/15	WLS
Aromatics-BTEX				ADEC 18AAC 78				
Benzene	0.231	D	mg/Kg	EPA 8020		06/10	06/15	WLS
Toluene	2.36	D	mg/Kg	EPA 8020		06/10	06/15	WLS
Ethylbenzene	1.29	D	mg/Kg	EPA 8020		06/10	06/15	WLS
p&m Xylene	6.24	D	mg/Kg	EPA 8020		06/10	06/15	WLS
o-Xylene	3.29	D	mg/Kg	EPA 8020		06/10	06/15	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

0037

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.2647-2
Client Sample ID :Y-204-3-S14
Matrix :SOIL

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S TESORO
Project# :Y-204-3
PWSID :UA

WORK Order :67049
Report Completed :06/16/93
Collected :06/08/93 @ 15:15 hrs.
Received :06/09/93 @ 09:20 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. PROJECT #Y-204-3. GARRETT'S TESORO.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	96.9		%	SM17 2540G			06/10	JME
Hydrocarbons VPH	1030	D	mg/Kg	EPA 5030/8015M		06/10	06/14	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.2647-3
Client Sample ID :Y-204-3-S15
Matrix :SOIL

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S TESORO
Project# :Y-204-3
PWSID :UA

WORK Order :67049
Report Completed :06/16/93
Collected :06/08/93 @ 15:30 hrs.
Received :06/09/93 @ 09:20 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. PROJECT #Y-204-3. GARRETT'S TESORO.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	96.4		%	SM17 2540G			06/10	JME
Hydrocarbons VPH	1620	D	mg/Kg	EPA 5030/8015M		06/10	06/14	WLS
Aromatics-BTEX				ADEC 18AAC 78				
Benzene	0.276	D	mg/Kg	EPA 8020		06/10	06/15	WLS
Toluene	13.0	D	mg/Kg	EPA 8020		06/10	06/15	WLS
Ethylbenzene	13.0	D	mg/Kg	EPA 8020		06/10	06/15	WLS
p&m Xylene	184	D	mg/Kg	EPA 8020		06/10	06/14	WLS
o-Xylene	84.9	D	mg/Kg	EPA 8020		06/10	06/14	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.
UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.2647-4
Client Sample ID :Y-204-3-S16
Matrix :SOIL

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S TESORO
Project# :Y-204-3
PWSID :UA

WORK Order :67049
Report Completed :06/16/93
Collected :06/08/93 @ 15:50 hrs.
Received :06/09/93 @ 09:20 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. PROJECT #Y-204-3. GARRETT'S TESORO.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	96.2		%	SM17 2540G			06/10	JME
Hydrocarbons VPH	700	D	mg/Kg	EPA 5030/8015M		06/10	06/14	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

0040

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :93.2647-5
Client Sample ID :Y-204-3-S17
Matrix :SOIL

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S TESORO
Project# :Y-204-3
PWSID :UA

WORK Order :67049
Report Completed :06/16/93
Collected :06/08/93 @ 16:10 hrs.
Received :06/09/93 @ 09:20 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. PROJECT #Y-204-3. GARRETT'S TESORO.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	95.9		%	SM17 2540G			06/10	JME
Hydrocarbons VPH	1110	D	mg/Kg	EPA 5030/8015M		06/10	06/14	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

Chain of Custody Record

Page 1 of 1

Laboratory Chem & Geo

Attn: _____

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	ETH 5330/8015 GRO	ETH 8020 BTEX						Total Number of Containers	Remarks/Matrix
Y-204-3-S12		3:00	6/8/93		✓	X	X						2	SOIL
Y-204-3-S14		3:15	6/8/93		✓	X							2	↓
Y-204-3-S15		3:30	6/8/93		✓	X	X						2	
Y-204-3-S16		3:50	6/8/93		✓	X							2	
Y-204-3-S17		4:10	6/9/93		✓	X							2	

(1)(2)(3)(4)(5)

Project Information	Sample Receipt
Project Number: Y-204-3	Total Number of Containers
Project Name: Gas Station	COC Seals/Intact Y/N/NA
Contact: Susan Guhl	Received Good Cond./Cold
Ongoing Project? Yes ☒ No ☐	Delivery Method:
Sampler: Susan Guhl	(attached shipping bill, if any)

Instructions

Requested Turn Around Time: Standard

Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan L Guhl Time: 0920	Signature: Time:	Signature: Time:
Printed Name: SUSAN L GUHL Date: 6/9	Printed Name: Date:	Printed Name: Date:
Company: SHANNON & WILSON	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Douglas E. VanCleve Time: 0920	Signature: Time:	Signature: Time:
Printed Name: Douglas E. VanCleve Date: 6/9	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

1041

APPENDIX B

"IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING/SUBSURFACE WASTE MANAGEMENT REPORT"

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Attachment to Report
Dated: February 12, 1994
To: Nelson Garrett

Important Information About Your Geotechnical Engineering/ Subsurface Waste Management (Remediation) Report

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND PERSONS.

Consulting geotechnical engineers prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the geotechnical engineer/geoscientist.

AN ENGINEERING REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical engineering/subsurface waste management (remediation) report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, have the consulting engineer(s)/scientist(s) evaluate how any factors which change subsequent to the date of the report, may affect the recommendations. Unless your consulting geotechnical/ civil engineer and/or scientist indicates otherwise, your report should not be used: 1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); 2) when the size, elevation, or configuration of the proposed project is altered; 3) when the location or orientation of the proposed project is modified; 4) when there is a change of ownership; or 5) for application to an adjacent site. Geotechnical/civil engineers and/or scientists cannot accept responsibility for problems which may occur if they are not consulted after factors which were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural changes or human influence. Because a geotechnical/waste management engineering report is based on conditions which existed at the time of subsurface exploration, construction decisions should not be based on an engineering report whose adequacy may have been affected by time. Ask the geotechnical/waste management consultant to advise if additional tests are desirable before construction starts. For example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/waste management report. The geotechnical/civil engineer and/or scientist should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST GEOTECHNICAL RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help minimize their impact. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your geotechnical engineer's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Because actual

subsurface conditions can be discerned only during earthwork, you should retain your geotechnical engineer to observe actual conditions and to finalize conclusions. Only the geotechnical engineer who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The geotechnical engineer who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE GEOTECHNICAL ENGINEERING/SUBSURFACE WASTE MANAGEMENT (REMEDIATION) REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical engineering/subsurface management (remediation) report. To help avoid these problems, the geotechnical/civil engineer and/or scientist should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological and waste management findings and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE ENGINEERING/WASTE MANAGEMENT REPORT.

Final boring logs developed by the geotechnical/civil engineer and/or scientist are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical engineering/waste management reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To minimize the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/waste management report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes which aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical engineering/subsurface waste management (remediation) is 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/ waste management 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 which identify where the engineer's or scientist's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your engineer/scientist will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland

L20.01

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

SEATTLE
HANFORD
FAIRBANKS
ANCHORAGE
BOSTON
SAINT LOUIS

0045

February 3, 1994

RECEIVED
FEB 9 1994
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
ADC

Anchorage Water & Wastewater Utility
3000 Arctic Boulevard
Anchorage, Alaska 99503-3898

Attn: Mr.Peter Jeskie, Code Enforcement Officer

RE: GROUNDWATER TREATMENT SYSTEM SAMPLING PLAN REVISION, GARRETT'S TESORO, 724 WEST INTERNATIONAL AIRPORT ROAD, ANCHORAGE, ALASKA, SPILL # 90-2-1-0-010-1, FILE L20.01

In answer to your correspondence of January 19, 1994, Shannon & Wilson is submitting revisions to our soil and groundwater remediation workplan for 1994. Presented here are our revised comments regarding the questions presented in your correspondence.

1. Question: The document does not address the operation and purpose of in-line alarms:

LEL meters: There are four LEL meters installed at the environmental shed at the above location. One LEL meter monitors the explosive vapor level in the exhaust fume piping directly connected to the three (3) vapor extraction (VES) lines running to the treatment shed. The fume LEL meter is set at three levels:
1) 10% causes a caution to be registered by the system electronics,
2) 15% indicates a warning to the system, and
3) 20% causes the VES system to shut off entirely.

The three other LEL meters installed are designed to measure the LEL in the vapors inside the shed. These are placed at both ends of the shed near the water and vapor treatment system components. The shed LEL meters are set to these alarm levels:
1) 5% produces a caution in the system
2) 7% produces a warning, and
3) 10% causes the VES system to shut off entirely.

O/W separator whole product reservoir level indicating floats: The float mechanism installed in the oil/water separator tank is designed to provide an indicator of the presence of floating product collecting in the tank. A contact device is set at a height of safe operation of the pumping system. As the water level rises, the fluid in the tank contacts the device. If the fluid does not cause a ground to the system to occur, this indicates that product is present, and the pump shuts off. If a ground is made, the fluid is registered as a water (not product) and the pump continues its operation. The contact device work on the principle of electrical conductivity, and prevents product from flowing through the system and being discharged into the sanitary sewer.

2. Question: The document does not address maintenance of the system in regards to what periodic maintenance needs to be performed on a routine basis and when this would occur.

Answer: BC Excavating will be providing system maintenance services. On a weekly basis during the operation a trained representative from BC Excavating will visit the site to visually inspect the operations of the VES and groundwater pump and treat systems. He will inpsect the LEL meters, the inflow water pipe filter, the water and vapor pumps and

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ANCHORAGE, ALASKA 99518
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overall system component operations. He will record the findings and activities of each visit in a Maintenance Log kept on-site. He will repair any components requiring adjustment, and will contact Shannon & Wilson with the results of the repairs.

3. Question: The document does not address discharge monitoring or sampling procedures. There are no statements describing where sample ports are located, how samples will be collected, sample containers, etc.

Answer: Shannon & Wilson will sample the groundwater pump and treat system according to the requirements of the AWWU approved Permit No. 32. The system will be sampled from the influent and effluent pipe sample ports located in the environmental shed. The groundwater withdrawn from the Recovery Well RW1 and the effluent sample port after passing through the shallow tray stripper, will be analytically tested for oil and grease (EPA 413.2), aromatic volatile organics (EPA 602), dissolved lead (EPA 239.2, total petroleum hydrocarbons (EPA 418.1) and AWWU Priority Pollutants (CT&E Bank No. 15001). All sample containers will be obtained from CT&E with proper preservatives included prior to each sampling event.

Upon start-up, the influent and effluent samples will be analyzed on a 24-hour rush basis. After sample collection on the first day, the water pumping system will be shut down until the results indicate that water to be discharged to the sewer meets Permit No. 32 requirements. Upon verifying that all permit levels are met, the water pump system will be turned on and treated water will be discharged into the AWWU system. During the second day of operation, a second water influent and effluent sample will be collected and also analyzed on a 24-hour rush basis to validate that treated water continues to meet discharge permit requirements.

The influent and effluent samples will then be collected weekly for the next three weeks, and then monthly thereafter, as required in Permit No. 32. All reporting of the results will follow the requirements set forth in the permit.

4. Question: Since the Activated Carbon Filtration unit was not installed as specified in the notice of intent, a description of the contingency plan to install the unit should be included. It should outline the resons the unit would need to be installed, how and where in the system the unit would be installed, and the operation and maintenance of the unit.

Answer: The enhanced system that was installed in Fall, 1993, now utilizes a highly efficient shallow tray stripper to remove the contaminants in the groundwater. The initial design as stated in the Notice of Intent did not contain the shallow tray stripper. It is estimated that the increased efficiency of this stripper may preclude any additional need for treatment and filtration. In the event that additional treatment is needed to meet discharge permit requirements, a carbon filtration system will be added to the effluent piping after the shallow tray stripper, but prior to the discharge point into the AWWU sewer system. Based upon the initial preliminary testing of the effectiveness of the shallow tray stripper conducted by Shannon & Wilson in January of this year, the need for addition of carbon filters is not anticipated at any point in the near future.

We hope this answers your questions. Please contact us with any additional comments or questions you may have.

Sincerely,

SHANNON & WILSON, INC

Susan L. Guhl
Hydrogeologist

Encl:

cc: Nelson Garrett, Owner
Robert Weimer, ADEC -WDO
Randy Mileur, ADEC UST Financial Assistance Program

L20.01

1048

SHANNON & WILSON, INC.
Geotechnical Consultants

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

LETTER OF TRANSMITTAL

To: Robert Weimer
UST Program, Anchorage Office

Date 2/12/96 Job No. Y-204-5

Attention:

Re: 724 W. International Airport Rd.
4th Quarterly Report

We are sending the following items:

☒ Attached ☐ Under separate cover via _____

☐ Report ☐ Proposal ☐ Drawings ☐ Sample ☐ Specifications

Copies	Date	No.	Description
1	2/96		Fourth Quarter 1995 Monitoring at Garrett's
			Tesoro, 724 W. International Airport Road,
			Anchorage, Alaska; Spill 90-2-1-0-010-1;
			File L20.01

These are transmitted:

☒ For your retention ☐ For your use ☐ As requested

☐ For review and comment ☐ For action specified below ☐ With corrections

☐ Please return by _____ ☐ Prints returned after use by us ☐ _____

Remarks:

Please call our office with any questions.

cc: Randy Mileur, UST Financial Assistance

Copies to _____ By Susan H. Browne

☐ Invoice File ☐ Correspondence File

L20.01

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

SEATTLE
HANFORD
FAIRBANKS
ANCHORAGE
BOSTON
SAINT LOUIS

3049

April 12, 1994

Alaska Department of Environmental Conservation
800 East Dimond Boulevard, Suite #3-470
Anchorage, Alaska 99515

Attn: Mr. Robert Weimer

RE: JANUARY TO MARCH, 1994 REMEDIATION MONITORING AT GARRETT'S TESORO, 724 WEST INTERNATIONAL AIRPORT ROAD, ANCHORAGE, ALASKA, SPILL #: 90-2-1-0-010-1, FILE #: L20.01

This letter report summarizes the status of the groundwater pump and treat and vapor extraction system at Garrett's Tesoro, 724 West International Airport Road, Anchorage, Alaska, for the period of January through March, 1994. Also included are the results of quarterly groundwater monitoring conducted at the subject site. A site plan illustrating the general features at the project location is presented in Figure 1.

VES Monitoring

The Vapor Extraction System (VES) located at this site consists of two subsurface horizontal vapor recovery lines and one vertical vapor extraction well. The locations of these lines are shown in Figure 1. An additional dual purpose water pump and treat/extraction well exists on-site but was not incorporated into the VES system based on poor vapor recovery during feasibility testing. This well, designated RW1, is the pumping well for the groundwater treatment system. The VES system began continuous operation on January 5, 1994.

Monitoring of the Vapor Extraction System (VES) included the collection of vapor analytical samples from the sampling port installed on the exhaust manifold. Vapor samples were collected every 24 hours for the first seven days of operation, weekly for the subsequent three weeks, and once in March for a monthly sample. Presently, stack exhaust sample collection is being conducted on a monthly basis.

Prior to sampling, field measurements were conducted to ensure the vapor sample was representative of the stack exhaust. To accomplish this, a polyethylene bag was used to capture exhaust vapors from the sampling port. Approximately every 5 minutes, temperature and flame ionization detector (FID) readings of the stack emissions were recorded. In addition, the velocity of air movement in the stack exhaust and the individual VES lines was measured in inches of water using an anemometer and/or pitot tubes. Once these parameters stabilized, analytical samples were collected in 1 liter stainless steel cylinders provided by the laboratory.

Vapor Samples VES1 through VES7 were collected from the stack sampling port on a daily basis between January 5 and January 11, 1994. Weekly vapor samples were collected for the following month, with Vapor Samples VES8, VES9, and VES10 collected on January 18, January 25, and February 2, respectively. The first monthly sample, designated VES11, was collected on March 15,1994. A log of system performance, including dates of sample collection, is provided in Table 1.

To measure the influence of the vacuum in the subsurface, a magnehelic vacuum gauge attached to a well cap was placed on both Monitoring Wells B1MW and B2MW to measure the

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pressure differential experienced at these two locations. On March 25, 1994, the vacuum was measured at about 3.5-inches of water in both wells. These measurements indicate that the zone of influence around VES Line No. 2 extends to beyond the well locations. B2MW, the most distant of the two wells, is shown on Figure 1 to be about 30 feet from the westernmost end of the Line No. 2.

Groundwater Pump and Treat System Monitoring

The groundwater pump and treat system at this site consists of two unit operations: an oil/water separator with a batch holding tank followed in series by a shallow-tray air stripper. Groundwater is recovered from a single on-site recovery well, designated RW1 in Figure 1, using an on-line pump and passed through a sediment filter and flow meter prior to entering the batch tank. A four hour performance test of the treatment system was conducted on January 5, 1994 with the system in a recirculation mode. No treated effluent was discharged into the Anchorage Water and Wastewater Utility (AWWU) sanitary sewer at this time, and the system was shut down after the 4 hour test. Water Samples WS1 (Influent) and WS2 (Effluent) were collected from the treatment system's influent and effluent streams during the system test, and were analyzed to determine the efficiency with which petroleum hydrocarbons were removed from the impacted groundwater.

As part of the preparation for continuous operation, the water treatment system was temporarily started for a 3-hour trial run on February 8, 1994, including disposal of effluent into the sewer system. At the conclusion of this run, Influent Sample RW1-Infl-S2 and Effluent Sample RW1-Effl-S2 were collected from the system's influent and effluent sampling ports, respectively. The approximate rate of water flow into the system was 5 gallons per minute, as measured by BC Excavating during regularly scheduled site visits. Following receipt of analytical results demonstrating compliance with AWWU Permit Number 32 for discharge to the sanitary sewer, the system began continuous operation on February 10, 1994.

For the first month following startup, water samples were collected each week from the influent and effluent sampling ports of the water treatment system. Influent water Samples RW1-Infl-S3, RW1-Infl-S4, and RW1-Infl-S5, and effluent water Samples RW1-Effl-S3, RW1-Effl-S4 and RW1-Effl-S5 were collected on February 10, 18, and 23, 1994, respectively. The results of these samples were used to monitor the system's BTEX and TPH removal efficiency, and confirm compliance with the AWWU discharge permit. Temperature, specific conductance, and pH (T-C-pH) values of the water samples were measured in the field at the time of sampling. A description of each water sample collected is provided in Table 2, with the results of the T-C-pH measurements presented in Table 4.

The groundwater treatment system operated continuously between February 10, 1994 and March 3, 1994. On March 3, AWWU was notified that the system was shut down due to receipt of test results for Effluent Sample RW1-Effl-S5 which exceeded the permit limit of 0.1 ppm total BTEX. A subsequent inspection of the system revealed that several seals were not seated properly during the system's initial construction, allowing water to bypass the shallow trays and thus avoid proper treatment.

The problem was corrected by B.C. Excavating on March 8, 1994. Following the repair work, a four-hour test run was conducted on March 10, 1994, with Influent Sample RW1-Infl-S6 and Effluent Sample RW1-Effl-S6 collected immediately prior to shut-down. The rush turnaround analysis for Samples Infl-S6 and Effl-S6 showed that the shallow tray air stripper was working properly, and that the effluent met permit requirements. The system was restarted for continuous

operation on March 11, 1994 after laboratory results verified that BTEX and TPH levels in the effluent complied with the AWWU permit.

Additional weekly sampling of the system was conducted on March 21,1994 and April 1, 1994. These samples were designated Infl-S7 and Infl-S8, and Effl-S7 and Effl-S8, respectively. Test results for Effl-S7 indicated that non-detectable levels of BTEX and TPH meet AWWU permit requirements. Test results for Infl-S8 and Effl-S8 were not yet available, but will be forwarded upon receiving them.

Ambient Air Quality Monitoring

Ambient benzene standards of 0.1 ppm and 1.0 ppm for a time-weighted (TWA) 8-hour exposure have been established by NIOSH (National Institute for Occupational Safety & Health) and OSHA /ACGIH (Occupational Safety & Health Administration and the American Conference of Government Industrial Hygienists), respectively. Since this site is located in a residential area, the more stringent 0.1 ppm level for NIOSH will be adhered to.

The treatment systems located at this site produce two distinct sources of benzene emissions: the VES exhaust stack and the groundwater treatment stack. During the first month of VES operation, benzene levels in the eleven VES stack exhaust samples ranged from 8.99 ppm to 32.6 ppm. Although these levels exceed the NIOSH and OSHA standards, a thermal oxidizer is presently being used to burn off all recovered hydrocarbons in the stack exhaust. In contrast, the volatiles removed by the air stripper are vented to the atmosphere. Based on the recovery rates established by influent and effluent testing, the listed blower capacity, and an estimated water loading rate of 5 gallons per minute, benzene emissions to the atmosphere ranged from about 2.7 ppm to 5.3 ppm between January and March, 1994. To ensure that resulting ambient benzene levels are below the NIOSH standard, a monitoring program has been established which consists of both direct measurements and computer modelling of on-site ambient benzene concentrations.

Direct measurement of ambient benzene concentrations were made by placing a single 3M Model 3520 Organic Vapor Monitor Badge at each of four sampling stations positioned around the site, as shown in Figure 1. The badges were exposed for about 2 days and then were collected for laboratory analysis. Vapor Badge Samples AS1, AS2, AS3, and AS4 were placed on February 14, 1994 and collected on February 16, 1994 for a total exposure time of approximately 3,000 minutes. A description of each vapor sample collected is provided in Table 2.

In addition to the vapor badge sampling designed to monitor the actual direct emissions to the air, the EPA dispersion modelling program "Screen2" was used to calculate and estimate on-site ambient benzene concentrations resulting from dispersion of the stack exhaust and water treatment air stripper emissions. Site-specific inputs include the target compound (benzene) emission rate, the stack exhaust velocity, stack and receptor height, exhaust and ambient temperatures, and terrain information. These inputs are incorporated in a Gaussian plume model to determine the highest benzene concentration at specified discrete distances over a range of meteorological conditions. Using site-specific parameters measured in January to March, 1994, the modelling program calculated that a minimum total benzene emission of 397 ppm from within the exhasut stack was required to raise the calculated maximum ambient plume concentration to 0.1 ppm anywhere within 500 meters radius of the environmental shed.

In contrast, the air stripper's actual benzene emission during January to March, 1994 was calculated to have a maximum value of 5.3 ppm. When the Screen2 model was run using this emission rate, the maximum ambient concentration was determined to have TWA value of 0.0014

ppm benzene, at a location of 450 feet from the environmental shed. Although a maximum benzene concentration of 32.6 ppm was measured in the VES stack exhaust during the first 3 months of operation, its contribution to the ambient benzene concentration is assumed to be zero based on use of the thermal oxidizer. If the oxidizer was not used, the modelling program determined that a emission of 32.6 ppm benzene in the VES stack exhaust would result in a maximum ambient benzene concentration of 0.0082 ppm, located at a distance of 97 feet from the stack.

Based on these calculations and a safety factor of two, it is assumed that the NIOSH TWA benzene standard of 0.1 ppm will not be exceeded provided benzene emissions from the air stripper and the VES stack exhaust remain below 397 ppm. As long as the oxidizer remains in use, the contributions from the VES system to the ambient air are assumed to be zero. Likewise, based upon model calculations, emissions from the air stripper exhaust will not exceed 397 ppm so long as influent concentrations remain below 970 ppm benzene.

Groundwater Monitoring

Influent samples collected from the groundwater treatment system are used not only to determine the efficiency of the treatment system, but also to provide a gauge of the hydrocarbon concentrations remaining in the site's groundwater and the status of the remediation efforts. The influent sample testing is augemented by a quarterly monitoring program including one previously existing monitoring well, B2MW, and one newly installed replacement monitoring well, B1MW. With the exception of Monitoring Well B2MW, all previously installed monitoring wells at this site were made inaccessible or destroyed during the installation of three new USTs and associated site restoration which occured in 1992 and 1993 as part of Garrett's underground tank upgrade activities. In order to provide a minimum of two monitoring well locations for sampling, Monitoring Well B1MW was redrilled on February 6, 1994 in the close vicinity of its previous location on the north side of the project site. The horizontal elevation of this well will be surveyed in after the snow has melted from the surface of the site.

We are requesting approval for the replacement of B3MW, formerly located on the east portion of the site, close to the existing new USTs. This well was destroyed during tank installation. This well's replacement is critical to providing a third measuring point for groundwtaer levels, to assist in determining the groundwater potentiomentric surface. It is also needed to provide a third groundwater sampling point for the quarterly monitoring events.

A total of six groundwater samples were collected from Monitoring Wells B1MW and B2MW during the period of January 7 to March 25, 1994. Sample B2MWW1 was collected from Monitoring Well B2MW on January 7, 1994. After replacement Monitoring Well B1MW was redrilled in the vicinity of the former B1MW, another sampling event was conducted. Samples B1MWW1 and B2MWW1A were collected on February 8, 1994 from Monitoring Wells B1MW and B2MW, respectively. In addition, a quarterly sampling event was undertaken on March 25, 1994, with samples designated B1MWW2, B11MWW2 (QA field duplicate for B1MW), and B2MWW2. Temperature, specific conductance, pH, and dissolved oxygen values of each water sample was measured in the field at the time of sampling. The results of the purging, water level, pH, conductivity, temperature, and dissolved oxygen measurements for the January through March sampling events are presented in Table 7. The location of Monitoring Wells B1MW and B2MW, along with corresponding BTEX and VPH concentrations, are shown on Figure 1. Historical summaries of VPH, benzene and total BTEX concentrations are presented for Recovery Well RW1 and Monitoring Wells B1MW and B2MW in Graphs 2 through 4, respectively.

Laboratory Analyses

For this sampling round, eleven (11) vapor samples from the VES discharge stack were collected using stainless steel vapor canisters. All samples were submitted to Commercial Testing & Engineering (CT&E) of Anchorage under Chain-of-Custody procedures and were analyzed for aromatic volatile organics (BTEX) using EPA Method 8020 and volatile petroleum hydrocarbons (VPH) using EPA Method 5030/8015. The results for all vapor canister analyses are listed in Table 3 with the individual laboratory reports included in Appendix A.

From January 5 through April 1, 1994, a total of sixteen (16) influent and effluent water samples from the groundwater treatment system were submitted to CT&E for analysis. All sixteen samples were tested for BTEX and TPH. In addition, Samples WS1, WS2, RW1-Effl-S2, RW1-Effl-S3 were tested for dissolved metals and oil and grease (AWWU priority pollutants) to satisfy AWWU reporting requirements. Sample RW1-Effl-S3 was further analyzed for GRO levels. The results for all groundwater treatment analyses received to-date are listed in Table 4 with the individual laboratory reports included in Appendix A.

On April 1, 1994, another weekly sampling was conducted, with samples Infl-S8 and Effl-S8 submitted for TPH and BTEX analysis. The results for samples Infl-S7, Effl-S7, Infl-S8 and Effl-S8 were not available at the writing of this report, and will be forwarded as soon as received.

Four ambient air vapor badges were also submitted to CT&E and were analyzed for BTEX using EPA Method 8020 and VPH using EPA Method 5030/8015. The results of these analyses are listed in Table 5 and are plotted in Graph 1 as a time trend historical record of hydrocarbon concentrations in the stack exhaust. The individual laboratory reports are provided in Appendix A.

The six groundwater samples collected from Monitoring Wells B1MW and B2MW were also submitted to CT&E for analysis. Sample B2MWW1 was tested for BTEX using EPA Method 602, dissolved metals using EPA Method 200 series, and oil and grease using EPA Method 413.2. Upon direction from Mr. Robert Weimer, ADEC-ADO, Samples B1MWW1 and B2MWW1A (2nd B2MW sample event) were tested for BTEX, gasoline range organics (GRO) using EPA Method 5030/8015, and diesel range organics (DRO) using EPA Method 3550/8100. All subsequent quarterly sampling will be tested for GRO, DRO and BTEX, per request by ADEC. Samples B1MWW2, B11MWW2 and B2MWW2 were also tested for TPH and BTEX. The results for all groundwater analyses are listed in Table 6 with the individual laboratory reports included in Appendix A.

Discussion of Results

Soil Vapor - As shown in Graph 1, the gasoline range organics (VPH) concentration in the stack exhaust samples generally decreased during the January to March, 1994 sampling period. Exceptions to this trend include the VPH levels measured in Samples VES7 and VES9. The GRO concentrations in the individual vapor samples ranged from a maximum concentration of 1980 ppm, or 187 lb/day, in Sample VES1 to 287 ppm, or 22 lb/day, in Sample VES10. The trend in the stack samples' benzene concentrations generally mirrored that exhibited by the VPH concentration. However, the highest benzene concentration in the vapor samples was measured in Sample VES7, with values ranging from 32.6 ppm in Sample VES7 to 8.99 ppm in Sample VES8.

Using the Ideal Gas Law, gasoline range organic (GRO) analytical results, and the calculated daily rate of air flow from the VES, the average daily rate of volatile petroleum hydrocarbon discharge for the sampling period from January 5 to March 15, 1994 was computed

to be about 35 pounds per day. Approximately 2370 pounds of volatile petroleum hydrocarbons were vented from the site's subsurface soil during this period of VES operation. For the first six days of operation, approximately 700 pounds, or 120 pounds per day, were vented by the VES system. This rate of emissions has greatly reduced during system operations for February and March, 1994.

Treated Groundwater - For all samples received to date, concentrations of total BTEX in the treatment system's influent samples ranged from 24.33 ppm in Sample RW1-Infl-S7 to 60.17 ppm in Sample RW1-Effl-S2, with an average value of 39 ppm total BTEX. Similarly, TPH levels in the influent samples ranged from 6.61 ppm in Sample RW1-Infl-S7 to 11.1 ppm in Sample RW1-Infl-S3, with an average value of 8.9 ppm TPH. As shown in Table 4, the TPH and total BTEX concentrations in the influent samples indicate that groundwater treatment is necessary to reduce hydrocarbon concentrations in the groundwater to below the concentrations allowed by our permit requirements. Although the TPH concentrations have fluctuated over the first seven influent samples, it is evident in Graph 2 that concentrations of benzene and total BTEX in the recovered groundwater are steadily decreasing.

All effluent samples satisfied the permit requirements for TPH, with values ranging from non-detectable in Samples RW1-Effl-S2 and RW1-Effl-S3 to 0.26 ppm in Sample RW1-Effl-S5. The total BTEX levels of 0.0077 ppm, 0.0062 ppm, 0.0308 ppm, and 0.0208 ppm contained in effluent Samples WS2, RW1-Effl-S2, RW1-Effl-S3, and RW1-Effl-S4, respectively, are less than the 0.1 ppm total BTEX limit specified in the AWWU permit. As stated previously, the 1.44 ppm total BTEX in effluent Sample RW1-Effl-S5 exceeded the permitted level. Upon receiving these results indicating the treatment system was not performing adequately, the system was immediately shut off. Effluent Sample RW1-Effl-S6, collected after repairs to the treatment system were completed, contained 0.0022 ppm total BTEX and verified that the treatment system was again in compliance with the discharge permit.

Based upon the influent and effluent sample results, the groundwater treatment system's total BTEX removal efficiency was 99.99%, 99.99%, 99.93%, 99.94%, 95.43%, 99.99% and 99.99% for the seven sampling events during the January to March, 1994 period. Excluding Sample RW1-Effl-S5, the average residual concentration of total BTEX in the seven effluent samples was 0.010 ppm. As part of Permit No. 32 requirements, Mr. Ed Tatro and Mr. Peter Jeskie of AWWU were notified of the above results in required monthly reports, dated February 16, 1994 and March 16, 1994.

Ambient Air -Vapor Badges Y-204-3-AS1 through -AS4 were placed at ambient air Stations No. 1 through No. 4, respectively, from February 11 through 16, 1994. Vapor Badge AS1 contained 0.166 ppm GRO and 0.0096 ppm benzene, Vapor Badge AS2 contained 0.328 ppm GRO and 0.0156 ppm benzene, Vapor Badge AS3 contained 0.256 ppm VPH and 0.0077 ppm benzene, and Vapor Badge AS4 contained 0.166 ppm VPH and 0.0105 ppm benzene.

As shown in Table 5, the ambient benzene concentrations measured with the vapor badges are below the 0.1 ppm NIOSH standard established for this site. However, the measured levels are above the non-detectable benzene emissions expected from the stack exhaust when operating in conjunction with the thermal oxidizer. A likely cause for this discrepancy is the presence of relatively large background levels contributed by customer retail petroleum fuel sales activity conducted at the on-site service facility and emissions from nearby traffic flow on Arctic Blvd. and International Airport Road. The vapor badge results do agree with the maximum ambient benzene concentration calculated by the modelling program for worst-case meteorological conditions and

zero percent oxidizer efficiency. Specifically, the computer-derived value of 0.0082 ppm benzene located 97 feet from the exhaust stack correlates similarly to the benzene level measured with each vapor badge.

Groundwater - Groundwater Sample B2MWW1, collected from Monitoring Well B2MW on January 7, 1994, contained 85.71 ppm total BTEX with 47.5 ppm benzene, 28.1 ppm toluene, 2.09 ppm ethylbenzene, and 8.02 ppm xylenes; 42.7 ppm oil and grease; 0.0063 ppm arsenic, 0.015 ppm lead, and non-detectable levels of mercury and zinc. Lower BTEX levels were measured in the groundwater sample taken from Monitoring Well B2MW on February 8, 1994. Sample B2MWW1A contained 64.6 ppm total BTEX with 22.3 ppm benzene, 27.4 ppm toluene, 2.85 ppm ethylbenzene, and 12.05 ppm xylenes. Sample B2MWW1A also contained 1.39 ppm diesel range organics (DRO) and 133 ppm gasoline range organics (GRO). Higher levels of petroleum hydrocarbons were present in the groundwater sample collected from Monitoring Well B1MW, as Sample B1MWW1 contained 86.92 ppm total BTEX with 48.5 ppm benzene, 29.4 ppm toluene, 1.36 ppm ethylbenzene, and 7.66 ppm xylenes; 3.96 ppm DRO; and 170 ppm GRO.

Samples B1MWW2 and B2MWW2 were collected from Monitoring Wells B1MW and B2MW, respectively, on March 25, 1994 as part of the first quarterly sampling event. Sample B1MWW2 contained 12.7 ppm DRO, 67.1 ppm GRO, and 44.95 ppm total BTEX with 9.38 ppm benzene, 16.6 ppm toluene, 4.0 ppm ethylbenzene, and 14.97 ppm xylenes; and Sample B2MWW2 contained 18.5 ppm DRO, 202 ppm GRO, and 125.26 ppm total BTEX with 63.3 ppm benzene, 45.6 ppm toluene, 3.47 ppm ethylbenzene, and 12.89 ppm xylenes. As shown in Graph 3, GRO, benzene, and total BTEX concentrations in Monitoring Well B1MW decreased from the February sampling event. In constrast, it is evident in Graph 4 that all three parameters increased in Monitoring Well B2MW since the previous event. The concentrations for VPH and BTEX were the highest observed since system start-up. These levels may indicate that movement of product enriched groundwater is moving toward the pumping well, RW1. Further quarterly monitoring will verify this trend.

For Quality Assurance (QA) purposes as outlined in the 1994 ADEC approved workplan, Sample B11MWW2 was collected as a field duplicate of Sample B1MWW2. Sample B11MWW2 contained 19.8 ppm DRO, 52.9 ppm GRO, and 34.57 ppm total BTEX with 6.95 ppm benzene, 12.40 ppm toluene, 3.16 ppm ethylbenzene, and 12.06 ppm xylenes. The data for Sample B1MWW2 and B11MWW2 is shown in Table 6 to agree within a factor of 2 for all analyzed parameters.

Future monitoring of Monitoring Wells B1MW and B2MW will be conducted on a quarterly basis and used to provide a gauge of the treatment system's effectiveness in lowering hydrocarbon concentrations in the site's groundwater.

On-Going System Monitoring

Overall, the VES and groundwater treatment system is functioning properly. Influent and effuent testing indicate that elevated hydrocarbon levels in the site's groundwater are removed by the air stripper with an efficiency of about 99.9%. Similarly, VES removal rates are gradually decreasing from a peak of 1980 ppm VPH on January 5, 1994 which corresponds to 187 pounds per day, to the latest sampling (-S11) with a calculated release of 10 pounds per day. A total of approximately 2370 pounds have been removed from the subsurface soils using the VES system.

According to the requirements of the ADEC approved 1994 Workplan, Shannon & Wilson will continue to monitor the operations and effectiveness of the remediation system. We will present the reports to ADEC following the predetermined schedule in the Workplan.

We appreciate this opportunity to be of service and your continued confidence in our firm. If you have any questions or comments concerning this submittal, please call the undersigned.

Sincerely,

SHANNON & WILSON, INC.

Prepared by:

Susan L. Guhl

Susan L. Guhl, C.P.G.
Hydrogeologist

Approved by:

Timothy M. Terry

Timothy M. Terry
Vice President by MS

Enc: Tables 1-7, Figure 1, Graphs 1-4, Appendix A

cc: Mr. Nelson Garrett, Garrett's Tesoro
Mr. Randy Mileur, ADEC UST Financial Assistance Program

TABLE 1 - VAPOR EXTRACTION SYSTEM (VES) MEASUREMENTS

Date	Time	Measurement Location/Note	FID ppm	VPH ppm	Temp F	Velocity† fpm	Air Flow scfm	Manometer (in. H20)	Knockout vacuum (in. H20)	Toxi-Guard A	Toxi-Guard B	Toxi-Guard C	Toxi-Guard D	Vapor Discharge lbs/day
1/5/94														
	14:12	Exhaust Stack	>10,000		91	--	235		24	34	1			
	15:20	Exhaust Stack	>10,000		90	5200	240		23	34	2			
	15:20	Line 1				>6000								
	15:20	Line 2				>6000								
	15:20	Line 3				>6000								
	15:50	Exhaust Stack	>10,000		86	5800	240		23	33	0			
	16:00	Exhaust Stack	>10,000		90	5500	240		23.5	33	0			
	16:30	Exhaust Stack	>10,000		92	5900	240		23	33	0			
	16:50	Exhaust Stack	>10,000		82	5800	240		23	33	1			
	17:30	Exhaust Stack	>10,000		91	5800	240		23	33	0			
	16:05	Analytical Sample Y-204-3-VES1 Collected												
	16:05	Exhaust Stack	>10,000	1980	90	5500	240		23.5	33	0			187
1/6/94														
	9:15	Analytical Sample Y-204-3-VES2 Collected												
	9:15	Exhaust Stack	8,000	1870	94	5500	235		24	28	1			172
1/7/94														
	11:55	Analytical Sample Y-204-3-VES3 Collected												
	11:55	Exhaust Stack	5,000	1370	100*	5200	235		24	27	0			125
		* Temperature Estimate due to Error in Temperature Gauge												
1/8/94														
	19:10	Analytical Sample Y-204-3-VES4 Collected												
	19:10	Exhaust Stack	4,600	1120	106	5900	235		24	24	0			101
1/9/94														
	16:50	Analytical Sample Y-204-3-VES5 Collected												
	16:50	Exhaust Stack	NA	847	108	>6000	235		24	23	0			76
1/10/94														
	9:45	Analytical Sample Y-204-3-VES6 Collected												
	9:45	Exhaust Stack	6,000	811	106	>6000	230		26	23	0			71
	11:50	Oxidizer Temp.			1325									

† Velocity is measured for VES Samples VES1-VES7 using an anemometer; velocity and air flow rate are calculated for Samples VES7-VES10 from manometer readings. Due to inaccuracies in the anemometer, air flow for VES Samples VES1-VES7 is calculated using the KO drum vacuum pressure.

TABLE 1 - VAPOR EXTRACTION SYSTEM (VES) MEASUREMENTS

Date	Time	Measurement Location/Note	FID ppm	VPH ppm	Temp F	Velocity† fpm	Air Flow scfm	Manometer (in. H20)	Knockout vacuum (in. H20)	Toxi-Guard A	Toxi-Guard B	Toxi-Guard C	Toxi-Guard D	Vapor Discharge lbs/day
1/11/94														
	16:25	Analytical Sample Y-204-3-VES7 Collected												
	16:05	Exhaust Stack	3,000	1480	110	>6000	220		29	23	0	0	0	124
1/17/94														
	9:00	Oxidizer Temp.			1235									
1/18/94														
	13:00	Manometers installed by BC Excavating.												
	16:31	Line1				650	57	0.025						
	16:32	Line2				1515	132	0.135						
	16:33	Line3				300	26	0.005						
	16:30	Analytical Sample Y-204-3-VES8 Collected												
	16:30	Exhaust Stack	2,300	307	106	2,300	201	0.31	30	23	0	0	0	24
1/25/94														
	12:50	Line1				710	62	0.03						
	12:51	Line2				1270	111	0.095						
	12:52	Line3				0	0	0						
	12:45	Analytical Sample Y-204-3-VES9 Collected												
	12:45	Exhaust Stack	2,000	551	103	2,300	201	0.31	35	22	1	2	1	43
2/2/94														
	13:10	Line1				510	45	0.015						
	13:13	Line2				1270	111	0.095						
	13:14	Line3				0	0	0						
	13:15	Analytical Sample Y-204-3-VES10 Collected												
	12:45	Exhaust Stack	2,000	287	109	2,300	201	0.31	36	22	1	2	1	22
3/15/94														
	12:35	Line1				710	62	0.03						
	12:36	Line2				1240	108	0.09						
	12:37	Line3				520	45	0.015						
	12:38	Analytical Sample Y-204-3-VES-S11 Collected												
	12:38	Exhaust Stack	2,000	212	118	1,460	127	0.12	47	23	0	0	0	10

† Velocity is measured for VES Samples VES1-VES7 using an anemometer; velocity is calculated for Samples VES7-VES10 from manometer readings. Due to inaccuracies in the anemometer, air flow for VES Samples VES1-VES7 is calculated using the KO drum vacuum pressure.

TABLE 2 - SAMPLE LOCATION AND DESCRIPTIONS

VAPOR SAMPLES

Sample Number	Date	Sample Location (See Figure 1)	Sample Classification
Y-204-3-VES1	1/5/94	Emission Stack sample	Air vapor sample
Y-204-3-VES2	1/6/94	Emission Stack sample	Air vapor sample
Y-204-3-VES3	1/7/94	Emission Stack sample	Air vapor sample
Y-204-3-VES4	1/8/94	Emission Stack sample	Air vapor sample
Y-204-3-VES5	1/9/94	Emission Stack sample	Air vapor sample
Y-204-3-VES6	1/10/94	Emission Stack sample	Air vapor sample
Y-204-3-VES7	1/11/94	Emission Stack sample	Air vapor sample
Y-204-3-VES8	1/18/94	Emission Stack sample	Air vapor sample
Y-204-3-VES9	1/25/94	Emission Stack sample	Air vapor sample
Y-204-3-VES10	2/3/94	Emission Stack sample	Air vapor sample
Y-204-3-VES11	3/15/94	Emission Stack sample	Air vapor sample

AMBIENT AIR SAMPLES

Sample Number	Date	Sample Location (See Figure 1)	Sample Classification
Y-204-3-AS1	2/14-16/94	Vapor Badge - Station #1	Ambient air sample
Y-204-3-AS2	2/14-16/94	Vapor Badge - Station #2	Ambient air sample
Y-204-3-AS3	2/14-16/94	Vapor Badge - Station #3	Ambient air sample
Y-204-3-A41	2/14-16/94	Vapor Badge - Station #4	Ambient air sample

TREATMENT SYSTEM WATER SAMPLES

Sample Number	Date	Sample Location (See Figure 1)	Sample Classification
Y-204-3-WS1	1/5/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-WS2	1/5/94	Groundwater Treatment System Effluent	Water Sample
Y-204-3-WS1 (Influent)	1/5/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-WS2 (Effluent)	1/5/94	Groundwater Treatment System Effluent	Water Sample
Y-204-3-RW1-Infl-S2	2/8/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-RW1-Effl-S2	2/8/94	Groundwater Treatment System Effluent	Water Sample
Y-204-3-RW1-Infl-S3	2/10/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-RW1-Effl-S3	2/10/94	Groundwater Treatment System Effluent	Water Sample
Y-204-3-RW1-Infl-S4	2/18/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-RW1-Effl-S4	2/18/94	Groundwater Treatment System Effluent	Water Sample

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TABLE 2 - SAMPLE LOCATION AND DESCRIPTIONS

TREATMENT SYSTEM WATER SAMPLES (CONT.)

Sample Number	Date	Sample Location (See Figure 1)	Sample Classification
Y-204-3-RW1-Infl-S5	2/23/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-RW1-Effl-S5	2/23/94	Groundwater Treatment System Effluent	Water Sample
Y-204-3-RW1-Infl-S6	3/10/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-RW1-Effl-S6	3/10/94	Groundwater Treatment System Effluent	Water Sample
Y-204-3-RW1-Infl-S7	3/21/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-RW1-Effl-S7	3/21/94	Groundwater Treatment System Effluent	Water Sample
Y-204-3-RW1-Infl-S8	4/1/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-RW1-Effl-S8	4/1/94	Groundwater Treatment System Effluent	Water Sample

GROUNDWATER SAMPLES

Sample Number	Date	Sample Location (See Figure 1)	Sample Classification
Y-204-3-B2MWW1	1/7/94	Monitoring Well MW2, Water Sample No. 1	Groundwater
Y-204-3-B1MWW1	2/8/94	Monitoring Well MW1, Water Sample No. 1	Groundwater
Y-204-3-B2MWW1A	2/8/94	Monitoring Well MW2, Water Sample No. 1	Groundwater
Y-204-3-B1MWW2	3/25/94	Monitoring Well MW1, Water Sample No. 1	Groundwater
Y-204-3-B11MWW2 (QA dup. for B1MWW2)	3/25/94	Monitoring Well MW1, Water Sample No. 1	Groundwater
Y-204-3-B2MWW2	3/25/94	Monitoring Well MW2, Water Sample No. 1	Groundwater

TABLE 3 - VES ANALYTICAL RESULTS

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Parameter	Method*	VES Sample Number (See Table 2 & Appendix A) VES1	VES2	VES3	VES4	VES5	VES6
FID Headspace reading - ppm	Sensidyne FID	>10,000	8,000	5,000	4,600	NA	6,000
Aromatic Volatile Organics							
Benzene - ppm	EPA 8020	26.70	20.60	25.20	17.10	17.00	15.90
Toluene - ppm	EPA 8020	17.50	12.70	30.20	8.31	23.70	20.10
Ethylbenzene - ppm	EPA 8020	0.29	1.55	2.17	0.26	0.54	1.13
p & m - Xylene - ppm	EPA 8020	4.92	6.46	22.90	2.37	9.62	10.10
o - Xylene - ppm	EPA 8020	1.93	2.97	10.80	1.08	4.09	4.40
Total BTEX - ppm	EPA 8020	51.34	44.28	91.27	29.12	54.95	51.63
Volatile Petroleum Hydrocarbons (VPH) - ppm	EPA 5030/8015	1980	1870	1370	1120	847	811
Volatile Petroleum Hydrocarbons (VPH) - lbs/day	Ideal Gas Law**	187	172	125	101	76	71

Parameter	Method*	VES Sample Number (See Table 2 & Appendix A) VES7	VES8	VES9	VES10	VES11	
FID Headspace reading - ppm	Sensidyne FID	3,000	2,300	2,000	2,000	2,000	
Aromatic Volatile Organics							
Benzene - ppm	EPA 8020	32.60	8.99	17.10	9.45	9.19	
Toluene - ppm	EPA 8020	38.10	4.16	13.30	4.84	6.49	
Ethylbenzene - ppm	EPA 8020	0.45	0.15	0.34	0.17	0.26	
p & m - Xylene - ppm	EPA 8020	6.71	1.02	4.44	1.34	3.1	
o - Xylene - ppm	EPA 8020	2.50	0.44	1.88	0.62	1.32	
Total BTEX - ppm	EPA 8020	80.36	14.76	37.06	16.42	20.36	
Volatile Petroleum Hydrocarbons (VPH) - ppm	EPA 5030/8015	1480	307	551	287	212	
Volatile Petroleum Hydrocarbons (VPH) - lbs/day	Ideal Gas Law**	124	24	43	22	10	

KEY	DESCRIPTION
NA	SAMPLE NOT ANALYZED FOR THIS PARAMETER
ND	NOT DETECTED
*	SEE APPENDIX A FOR LIMITS OF DETECTION
**	USING A GAS CONSTANT "R" OF 75.6 (SI UNITS)

TABLE 4 - WATER TREATMENT SYSTEM ANALYTICAL RESULTS

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Parameter	Method*	Water Sample Number (See Table 2 & Appendix A)					
		WS1	WS2	RW1-Infl-S2	RW1-Effl-S2	RW1-Infl-S3	RW1-Effl-S3
Date		1/5/94	1/5/94	2/8/94	2/8/94	2/10/94	2/10/94
Temperature - degrees C	Horiba U-10	6.5	9.3	NM	10	8.2	9.8
pH	Horiba U-10	7.03	8.46	NM	7.42	6.94	7.68
Conductivity - mmhos	Horiba U-10	0.63	0.589	NM	0.594	0.615	0.594
Volatile Petroleum Hydrocarbons (VPH) - ppm	EPA 5030/8015	NA	NA	NA	NA	77	NA
Aromatic Volatile Organics							
Benzene - ppm	EPA 602	25.5	0.0029	21.6	0.002	21.9	0.014
Toluene - ppm	EPA 602	19.6	0.0033	16.5	0.0023	16.4	0.011
Ethylbenzene - ppm	EPA 602	1.85	ND	1.57	ND	1.48	0.001
p & m - Xylene - ppm	EPA 602	4.78	0.0015	3.9	0.0019	3.74	0.0032
o - Xylene - ppm	EPA 602	1.96	ND	16.6	ND	1.59	0.0016
Total BTEX - ppm	EPA 602	53.69	0.0077	60.17	0.0062	45.11	0.0308
Dissolved Metals - Priority Pollutants	EPA 200 Series						
Arsenic - ppm	EPA 206.2	0.18	0.0071	NA	ND	NA	0.015
Lead - ppm	EPA 239.2	0.0058	0.0054	NA	ND	NA	ND
Mercury - ppm	EPA 245.1.2	ND	0.0003	NA	ND	NA	ND
Zinc - ppm	EPA 200.7	0.68	0.13	NA	0.35	NA	0.31
Oil & Grease - ppm	EPA 413.2	14.1	0.84	NA	0.34	NA	ND
Total Petroleum Hydrocarbons (TPH) - ppm	EPA 418.1	NA	NA	9.71	ND	11.1	ND

Parameter	Method*	Water Sample Number (See Table 2 & Appendix A)					
		RW1-Infl-S4	RW1-Effl-S4	RW1-Infl-S5	RW1-Effl-S5	RW1-Infl-S6	RW1-Effl-S6
Date		2/18/94	2/18/94	2/23/94	2/23/94	3/10/94	3/10/94
Temperature - degrees C	Horiba U-10	6.9	7.6	6.3	7	8	15
pH	Horiba U-10	6.76	7.29	6.83	7.39	6.7	6.9
Conductivity - mmhos	Horiba U-10	0.735	0.95	0.68	0.642	0.7	0.7
Aromatic Volatile Organics							
Benzene - ppm	EPA 602	15.9	0.0062	15.1	0.691	13.100	0.001
Toluene - ppm	EPA 602	12.3	0.0072	11.8	0.549	10.600	0.001
Ethylbenzene - ppm	EPA 602	1.04	0.0011	1	0.042	0.972	ND
p & m - Xylene - ppm	EPA 602	2.64	0.0039	2.5	0.108	2.490	ND
o - Xylene - ppm	EPA 602	1.18	0.0024	1.1	0.05	1.090	ND
Total BTEX - ppm	EPA 602	33.06	0.0208	31.5	1.44	28.252	0.0022
Total Petroleum Hydrocarbons (TPH) - ppm	EPA 418.1	8.11	0.21	8.54	0.26	9.28	0.2

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

TABLE 4 - WATER TREATMENT SYSTEM ANALYTICAL RESULTS

Parameter	Method*	Water Sample Number (See Table 2 & Appendix A)					
		RW1-Infl-S7	RW1-Effl-S7	RW1-Infl-S8	RW1-Effl-S8		
Date		3/21/94	3/21/94	4/1/94	4/1/94		
Temperature - degrees C	Horiba U-10	15	15	11	12		
pH	Horiba U-10	7.4	7.9	7.6	8.2		
Conductivity - mmhos	Horiba U-10	0.38	0.36	0.7	0.73		
Aromatic Volatile Organics							
Benzene - ppm	EPA 602	11.8	ND				
Toluene - ppm	EPA 602	8.93	ND				
Ethylbenzene - ppm	EPA 602	0.782	ND				
p & m - Xylene - ppm	EPA 602	1.96	ND				
o - Xylene - ppm	EPA 602	0.861	ND				
Total BTEX - ppm	EPA 602	24.333	ND				
Total Petroleum Hydrocarbons (TPH) - ppm	EPA 418.1	6.61	ND				

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

TABLE 5 - AMBIENT AIR ANALYTICAL RESULTS

		Ambient Air Badge Sample Number (See Table 2 & Appendix A)			
Parameter	**Method***	AS1	AS2	AS3	AS4
Volatile Petroleum Hydrocarbons (VPH) - ppm	EPA 5030/8015	0.166	0.328	0.256	0.166
Aromatic Volatile Organics					
Benzene - ppm	EPA 8020	0.0096	0.0156	0.0077	0.0105
Toluene - ppm	EPA 8020	0.0209	0.0326	0.0189	0.0234
Ethylbenzene - ppm	EPA 8020	0.0032	0.0050	0.0034	0.0046
p & m - Xylene - ppm	EPA 8020	0.0123	0.0169	0.0111	0.0141
o - Xylene - ppm	EPA 8020	0.0040	0.0059	0.0038	0.0050
Total BTEX - ppm	EPA 8020	0.0500	0.0760	0.0449	0.0576

KEY	DESCRIPTION
ND	NOT DETECTED
*	SEE APPENDIX A FOR LIMITS OF DETECTION

TABLE 6 - GROUNDWATER ANALYTICAL RESULTS

Parameter	Method*	Water Sample Number (See Table 2 & Appendix A)					
		B2MWW1	B1MWW1	B2MWW1A	B1MWW2	B11MWW2	B2MWW2
Date		1/7/94	2/8/94	2/8/94	3/25/94	3/25/94	3/25/94
Temperature - degrees C	Horiba U-10	6.6	5.8	5.7	12	12	9
pH	Horiba U-10	6.81	6.5	6.56	7.4	7.4	7.2
Conductivity - mmhos	Horiba U-10	0.907	0.844	0.939	0.4	0.4	0.48
Extractable Petroleum Hydrocarbons (EPH) - ppm	EPA 3550/8100	NA	3.96÷	1.39÷	12.7†	19.8†	18.5†
Volatile Petroleum Hydrocarbons (VPH) - ppm	EPA 5030/8015	NA	170	133	67.1	52.9	202
Aromatic Volatile Organics							
Benzene - ppm	EPA 602	47.5	48.5	22.3	9.38	6.95	63.30
Toluene - ppm	EPA 602	28.1	29.4	27.4	16.60	12.40	45.60
Ethylbenzene - ppm	EPA 602	2.09	1.36	2.85	4.00	3.16	3.47
p & m - Xylene - ppm	EPA 602	5.37	5.89	9.85	11.70	9.37	8.66
o - Xylene - ppm	EPA 602	2.65	1.77	2.2	3.27	2.69	4.23
Total BTEX - ppm	EPA 602	85.71	86.92	64.6	44.95	34.57	125.26
Dissolved Metals - Priority Pollutants	EPA 200 Series						
Arsenic - ppm	EPA 206.2	0.0063	NA	NA	NA	NA	NA
Lead - ppm	EPA 239.2	0.015	NA	NA	NA	NA	NA
Mercury - ppm	EPA 245.1.2	ND	NA	NA	NA	NA	NA
Zinc - ppm	EPA 200.7	ND	NA	NA	NA	NA	NA
Oil & Grease - ppm	EPA 413.2	42.7	NA	NA	NA	NA	NA

KEY	DESCRIPTION
NA	SAMPLE NOT ANALYZED FOR THIS PARAMETER
ND	NOT DETECTED
*	SEE APPENDIX A FOR LIMITS OF DETECTION
÷	"EPH PATTERN NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL, MORE CONSISTENT WITH GRO"

TABLE 7 - WATER SAMPLING LOG

0066

WATER LEVEL MEASUREMENT DATA

WELL NUMBER	B2MW	B1MW	B2MW	B1MW	B11MW	B2MW	
DATE WATER LEVEL MEASURED	1/7/94	2/8/94	2/8/94	3/25/94	3/25/94	3/25/94	
TIME WATER LEVEL MEASURED	11:55	10:35	10:30	11:25	11:25	12:55	
MP ELEVATION, FT	123.38	NM	123.38	NM	NM	123.38	
DEPTH TO WATER BELOW MP, FT	17.93	18.35	17.42	19.54	19.54	20.29	
WATER LEVEL ELEVATION, FT	105.45	NM	105.96	NM	NM	103.09	

SAMPLING/PURGING DATA

WELL NUMBER	B2MW	B1MW	B2MW	B1MW	B11MW	B2MW	
DATE SAMPLED	1/7/94	2/8/94	2/8/94	3/25/94	3/25/94	3/25/94	
TIME SAMPLED	12:30	11:20	11:35	11:25	11:25	3/25/94	
DEPTH TO WATER BELOW MP, FT	17.93	18.35	17.42	19.54	19.54	20.29	
TOTAL DEPTH OF WELL BELOW MP, FT	29.00	26.85	29.00	29.00	29.00	29.00	
WATER COLUMN IN WELL, FT	11.07	8.50	11.58	9.50	9.50	8.13	
GALLONS PER FOOT	0.16	0.16	0.16	0.16	0.16	0.16	
GALLONS IN WELL	1.77	1.36	1.85	1.52	1.52	1.30	
TOTAL GALLONS PUMPED/BAILED	7.0	6.0	6.0	5.0	5.0	5.0	
TEMPERATURE, C	6.6	5.8	5.7	12.0	12.0	9.0	
SPECIFIC CONDUCTANCE, UMHOS/CM	407	844	939	0.4	0.4	0.48	
pH	6.81	6.50	6.56	7.40	7.40	7.20	
DISSOLVED OXYGEN, PPM	NM	1.2	1.8	NM	NM	12.9	
DIAMETER OF WELL CASING	2-inch	2-inch	2-inch	2-inch	2-inch	2-inch	
REMARKS					QA Dup. B1MW		

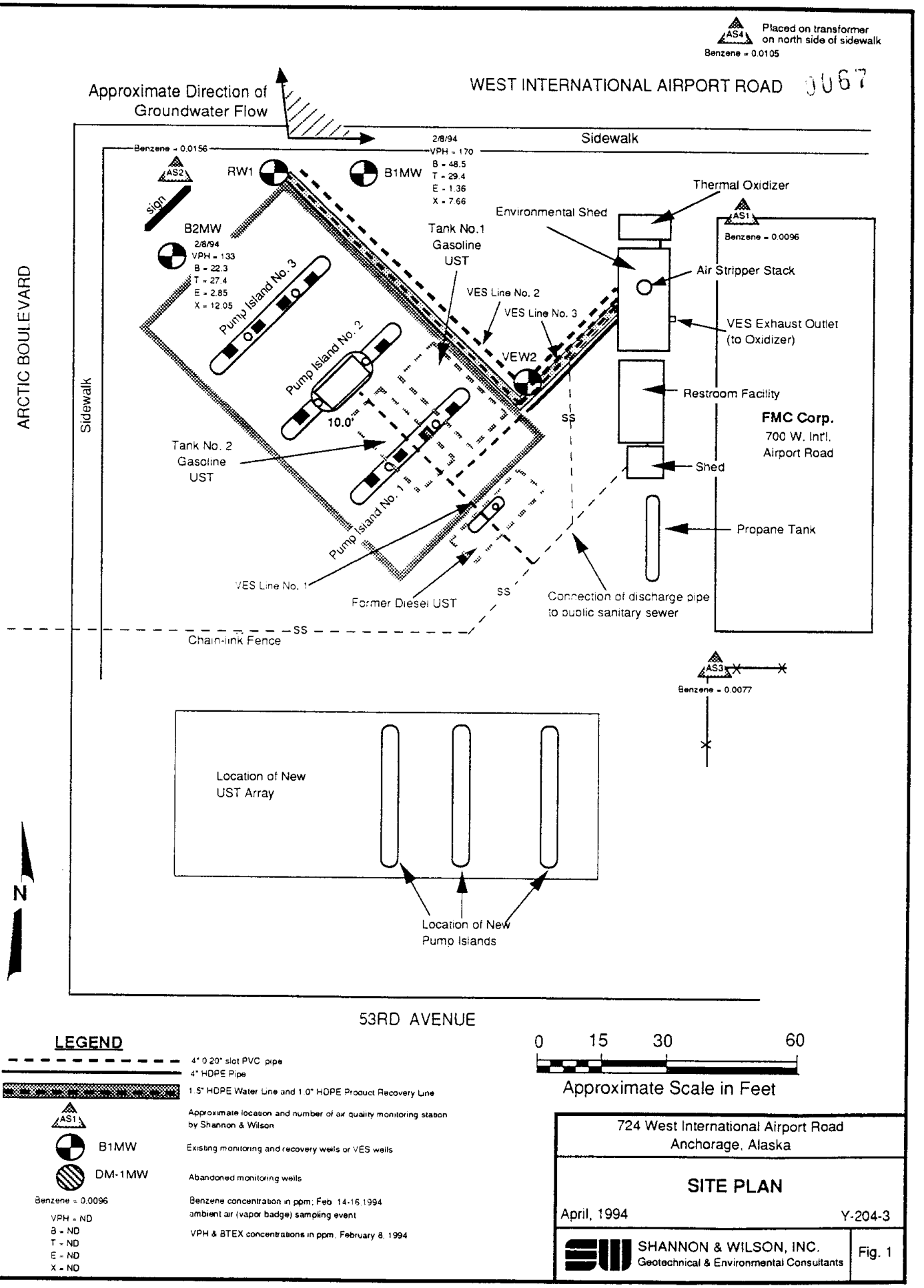
Purging & Sampling Method: Voss Disposable Bailer

Sampling Personnel: Matt Hemry, Linda Stanton, Susan L. Guhl

KEY

MP = Measuring Point

NM = Not Measured, Replacement Well To be Surveyed for Elevation



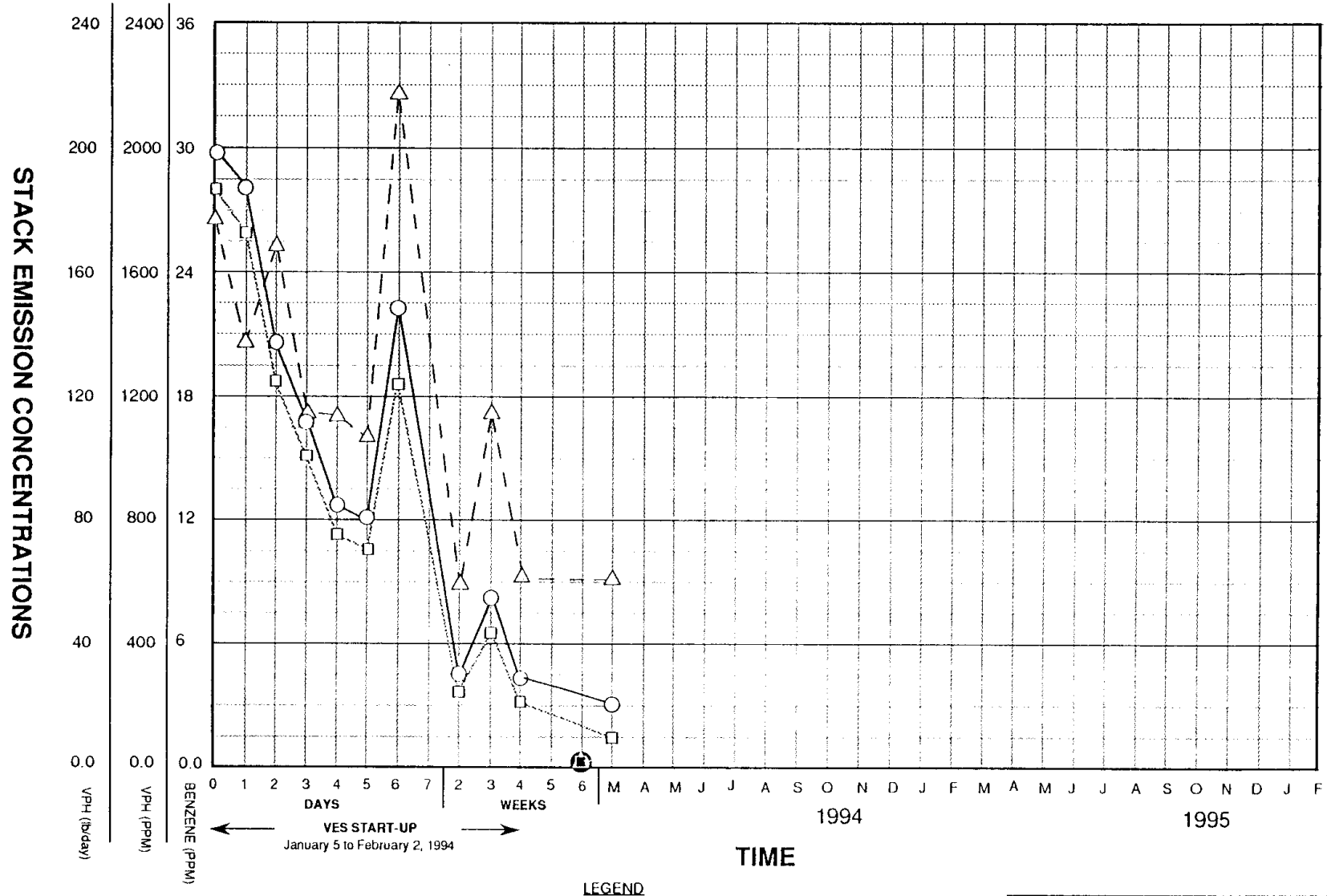
724 West International Airport Road
Anchorage, Alaska

SITE PLAN

April, 1994 Y-204-3

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 1



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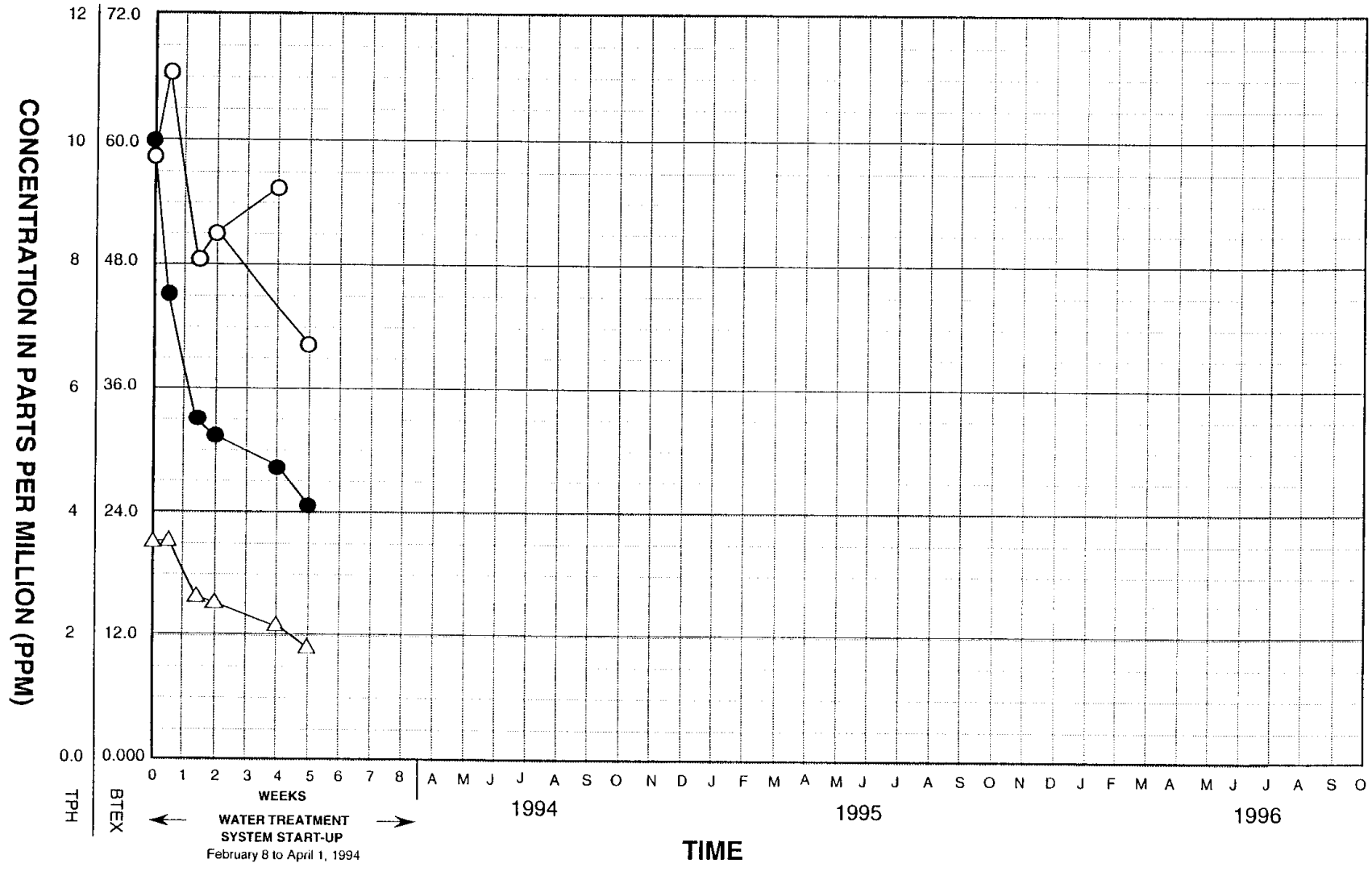
Anchorage, Alaska

VAPOR CONCENTRATION VS. TIME TRENDS

April, 1994 Y-204-3

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Graph 1



LEGEND

△ BENZENE
● TOTAL BTEX
○ TPH

1069

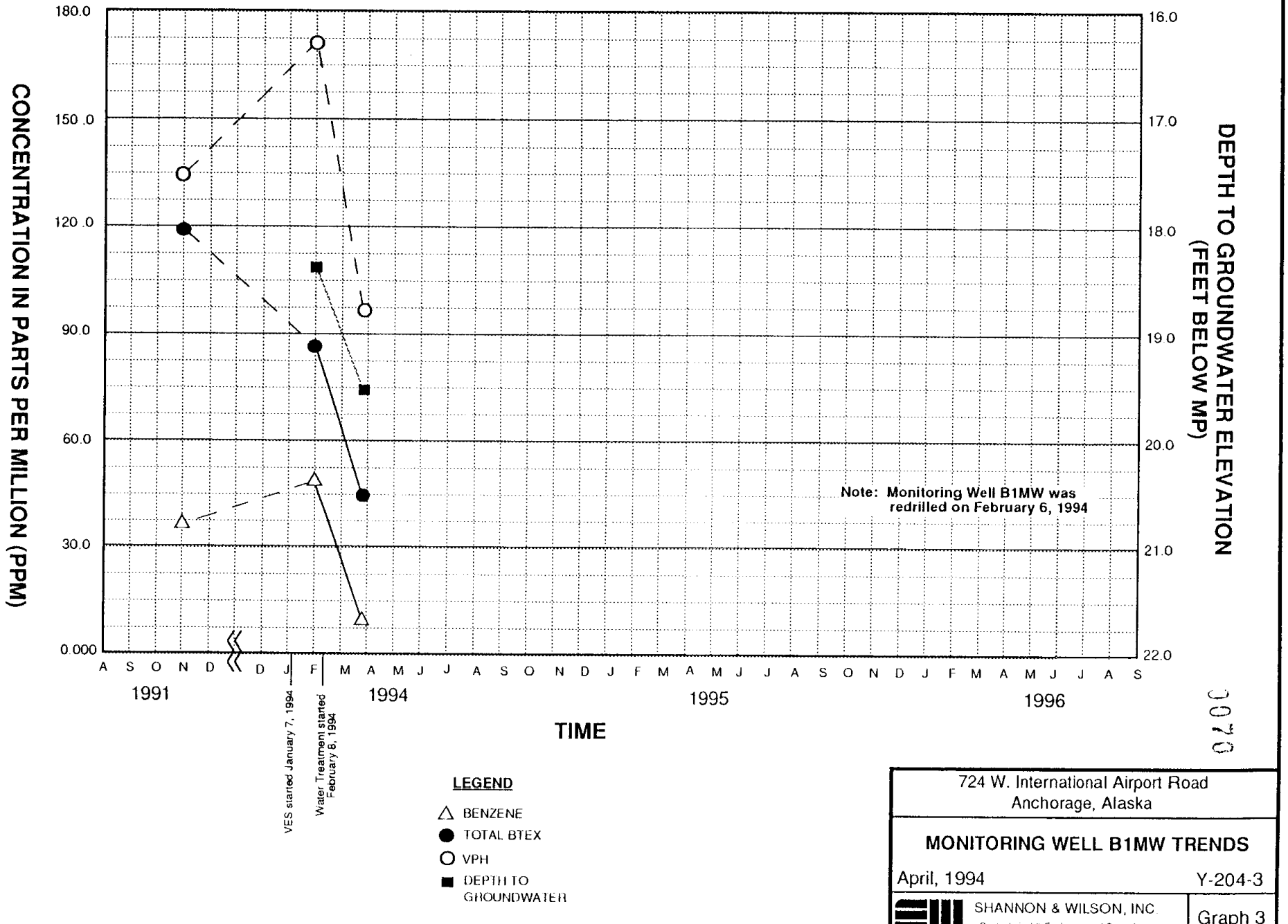
724 W. International Airport Road
Anchorage, Alaska

RECOVERY WELL RW1 TRENDS

April, 1994 Y-204-3

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Graph 2



0070

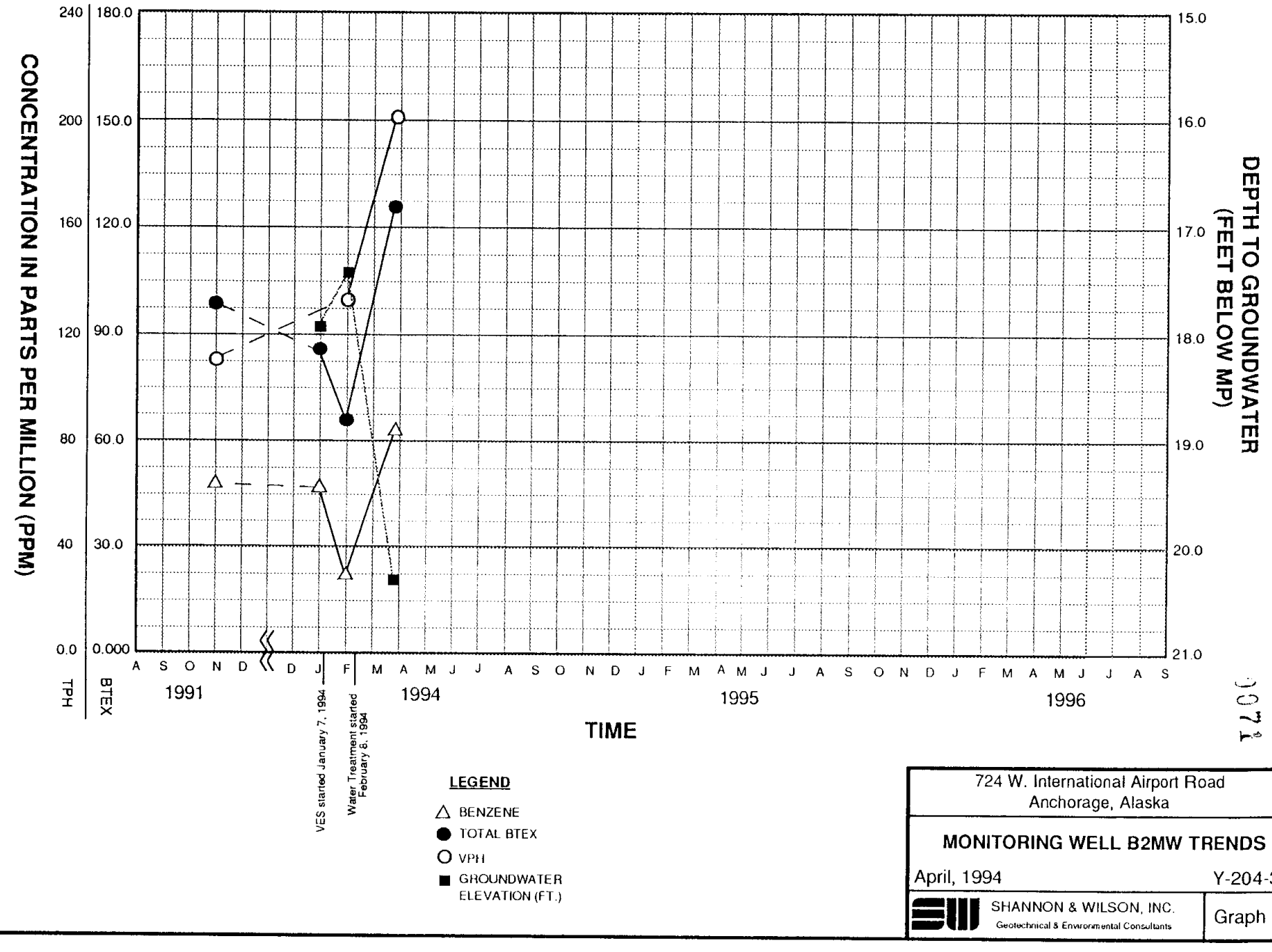
724 W. International Airport Road
Anchorage, Alaska

MONITORING WELL B1MW TRENDS

April, 1994 Y-204-3

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Graph 3



724 W. International Airport Road
Anchorage, Alaska

MONITORING WELL B2MW TRENDS

April, 1994 Y-204-3

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Graph 4

APPENDIX A

RESULTS OF ANALYTICAL TESTING BY

COMMERCIAL TESTING & ENGINEERING CO., ANCHORAGE, ALASKA

0073

ANALYTICAL RESULTS FOR VAPOR EMISSIONS SAMPLES

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

REPORT of ANALYSIS

0074

Chemlab Ref.# :94.0067-1
Client Sample ID :Y204-3-VES1
Matrix :GAS

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S TESORO
Project# :Y204-3
PWSID :UA

RUSH Order :74663
Report Completed :01/07/94
Collected :01/05/94 @ 16:05 hrs.
Received :01/05/94 @ 16:10 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: M.S.H.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	1980	D	ppm	EPA 5030/8015m			01/07	MDU

Benzene	26.7	D	ppm	EPA 8020			01/07	MDU
Toluene	17.5	D	ppm	EPA 8020			01/07	MDU
Ethylbenzene	0.29		ppm	EPA 8020			01/07	MDU
p&m Xylene	4.92		ppm	EPA 8020			01/07	MDU
o-Xylene	1.93		ppm	EPA 8020			01/07	MDU

See Special Instructions Above
** See Sample Remarks Above
'J = Undetected, Reported value is the practical quantification limit.
) = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.
Environmental Laboratory Services
SINCE 1908

5633 B Street
Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

REPORT of ANALYSIS

0075

Chemlab Ref.# :94.0076-1
Client Sample ID :Y204-3-VES2
Matrix :GAS

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S TESORO
Project# :Y204-3
PWSID :UA

WORK Order :74775
Report Completed :01/21/94
Collected :01/06/94 @ 09:35 hrs.
Received :01/06/94 @ 10:05 hrs.
Technical Director:STEPHEN C. EDE
Released By : C. Homestead

Sample Remarks: SAMPLE COLLECTED BY: M.S.H. AND S.L.G.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	1870	D	ppm	EPA 5030/8015m			01/20	MDU

Benzene	20.6	D	ppm	EPA 8020			01/20	MDU
Toluene	12.7	D	ppm	EPA 8020			01/20	MDU
Ethylbenzene	1.55	D	ppm	EPA 8020			01/20	MDU
p&m Xylene	6.46	D	ppm	EPA 8020			01/20	MDU
o-Xylene	2.97	D	ppm	EPA 8020			01/20	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

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0076

REPORT of ANALYSIS

5633 B Street
Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

Chemlab Ref.# :94.0106-3
Client Sample ID :Y-204-3-VES3
Matrix :WATER

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S TESORO
Project# :Y204-3
PWSID :UA

WORK Order :74785
Report Completed :01/21/94
Collected :01/07/94 @ 12:35 hrs.
Received :01/07/94 @ 13:00 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: M.S.H. AND S.L.G.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	1370	D	ppm	EPA 5030/8015m			01/20	MDU

Benzene	25.2	D	ppm	EPA 8020			01/20	MDU
Toluene	30.2	D	ppm	EPA 8020			01/20	MDU
Ethylbenzene	2.17	D	ppm	EPA 8020			01/20	MDU
p&m Xylene	22.9	D	ppm	EPA 8020			01/20	MDU
o-Xylene	10.8	D	ppm	EPA 8020			01/20	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

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Anchorage, AK 99518-1600
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Fax: (907) 561-5301

REPORT of ANALYSIS

Chemlab Ref.# :94.0125-1
Client Sample ID :Y-204-3-VES4
Matrix :GAS

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :74831
Report Completed :01/21/94
Collected :01/08/94 @ 19:25 hrs.
Received :01/10/94 @ 10:04 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	1120	D	ppm	EPA 5030/8015m			01/20	MDU

Benzene	17.10	D	ppm	EPA 8020			01/20	MDU
Toluene	8.31	D	ppm	EPA 8020			01/20	MDU
Ethylbenzene	0.26	D	ppm	EPA 8020			01/20	MDU
p&m Xylene	2.37	D	ppm	EPA 8020			01/20	MDU
o-Xylene	1.08	D	ppm	EPA 8020			01/20	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.
Environmental Laboratory Services
SINCE 1908

0078

REPORT of ANALYSIS

5633 B Street
Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

Chemlab Ref.# :94.0125-2
Client Sample ID :Y-204-3-VES5
Matrix :GAS

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :74831
Report Completed :01/21/94
Collected :01/09/94 @ 17:10 hrs.
Received :01/10/94 @ 10:04 hrs.
Technical Director:STEPHEN C. EDE
Released By : C. Homestead

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	847	D	ppm	EPA 5030/8015m			01/20	MDU

Benzene	17.0	D	ppm	EPA 8020			01/20	MDU
Toluene	23.7	D	ppm	EPA 8020			01/20	MDU
Ethylbenzene	0.54		ppm	EPA 8020			01/20	MDU
p&m Xylene	9.62		ppm	EPA 8020			01/20	MDU
o-Xylene	4.09		ppm	EPA 8020			01/20	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

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Environmental Laboratory Services
SINCE 1908

0079

REPORT of ANALYSIS

5633 B Street
Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

Chemlab Ref.# :94.0125-3
Client Sample ID :Y-204-3-VES6
Matrix :GAS

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :74831
Report Completed :01/21/94
Collected :01/10/94 @ 09:45 hrs.
Received :01/10/94 @ 10:04 hrs.
Technical Director:STEPHEN C. EDE
Released By : C. Homestead

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	811		ppm	EPA 5030/8015m			01/20	MDU

Benzene	15.9		ppm	EPA 8020			01/20	MDU
Toluene	20.1		ppm	EPA 8020			01/20	MDU
Ethylbenzene	1.13		ppm	EPA 8020			01/20	MDU
p&m Xylene	10.1		ppm	EPA 8020			01/20	MDU
o-Xylene	4.4		ppm	EPA 8020			01/20	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

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Environmental Laboratory Services
SINCE 1908

)080

REPORT of ANALYSIS

5633 B Street
Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

Chemlab Ref.# :94.0165-1
Client Sample ID :Y-204-3-VES7
Matrix :GAS

Client Name :SHANNON & WILSON, INC.
Ordered By :S. GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :74888
Report Completed :01/21/94
Collected :01/11/94 @ 16:40 hrs.
Received :01/11/94 @ 16:48 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	1480	D	ppm	EPA 5030/8015m			01/20	MDU

Benzene	32.6	D	ppm	EPA 8020			01/20	MDU
Toluene	38.1	D	ppm	EPA 8020			01/20	MDU
Ethylbenzene	0.45		ppm	EPA 8020			01/20	MDU
p&m Xylene	6.71		ppm	EPA 8020			01/20	MDU
o-Xylene	2.50		ppm	EPA 8020			01/20	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

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Commercial Testing & Engineering Co.

Environmental Laboratory Services

REPORT of ANALYSIS

5633 B Street
Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

Chemlab Ref.# :94.0280-1
Client Sample ID :Y-204-3-VES8
Matrix :GAS

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :75078
Report Completed :01/28/94
Collected :01/18/94 @ 16:35 hrs.
Received :01/18/94 @ 16:55 hrs.
Technical Director:STEPHEN C. EDE
Released By : C. Homestead

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUAL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	307	D	ppm	EPA 5030/8015m		01/26	01/26	MDU
Benzene	8.99		ppm	EPA 8020		01/26	01/26	MDU
Toluene	4.16		ppm	EPA 8020		01/26	01/26	MDU
Ethylbenzene	0.15		ppm	EPA 8020		01/26	01/26	MDU
p&m Xylene	1.02		ppm	EPA 8020		01/26	01/26	MDU
o-Xylene	0.44		ppm	EPA 8020		01/26	01/26	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.
Environmental Laboratory Services
SINCE 1908

0082

REPORT of ANALYSIS

5633 B Street
Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

CT&E Ref.# :94.0388-1
Client Sample ID :Y-204-3-VES9
Matrix :GAS

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :75254
Printed Date :02/02/94 @ 14:23 hrs.
Collected Date :01/25/94 @ 13:00 hrs.
Received Date :01/25/94 @ 14:00 hrs.
Technical Director :STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: S.G.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	551	D	ppm	EPA 5030/8015m			02/01	MDU
Benzene	17.1	D	ppm	EPA 8020			02/01	MDU
Toluene	13.3	D	ppm	EPA 8020			02/01	MDU
Ethylbenzene	0.34		ppm	EPA 8020			02/01	MDU
p&m Xylene	4.44		ppm	EPA 8020			02/01	MDU
o-Xylene	1.88		ppm	EPA 8020			02/01	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.
Environmental Laboratory Services
SINCE 1908

0083

REPORT of ANALYSIS

5633 B Street
Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

CT&E Ref.# :94.0540-1
Client Sample ID :Y-204-3-VES10
Matrix :GAS

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :75562
Printed Date :02/14/94 @ 15:55 hrs.
Collected Date :02/03/94 @ 13:15 hrs.
Received Date :02/03/94 @ 13:55 hrs.
Technical Director :STEPHEN C. EDE
Released By : Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	287	D	ppm	EPA 5030/8015m			02/10	MDU
Benzene	9.45		ppm	EPA 8020			02/10	MDU
Toluene	4.84		ppm	EPA 8020			02/10	MDU
Ethylbenzene	0.17		ppm	EPA 8020			02/10	MDU
p&m Xylene	1.34		ppm	EPA 8020			02/10	MDU
o-Xylene	0.62		ppm	EPA 8020			02/10	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

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Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.1089-1
Client Sample ID	Y-204-3-VES-S11
Matrix	GAS
Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y-204-3
PWSID	UA

WORK Order	76581		
Printed Date	03/28/94	@ 15:26	hrs.
Collected Date	03/15/94	@ 12:38	hrs.
Received Date	03/15/94	@ 12:57	hrs.

Technical Director: STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	212	D	ppm	EPA 5030/8015m			03/25/94	MDU

Benzene	9.19		ppm	EPA 8020			03/25/94	MDU
Toluene	6.49		ppm	EPA 8020			03/25/94	MDU
Ethylbenzene	0.26		ppm	EPA 8020			03/25/94	MDU
p&m Xylene	3.10		ppm	EPA 8020			03/25/94	MDU
o-Xylene	1.32		ppm	EPA 8020			03/25/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

74.0067

Shannon & Wilson, Inc.

Ch ...tody Record

Page 1 of 1

Laboratory CT&E

Attn: _____

400 N. 34th Street, Suite 100
Seattle, WA 98103
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2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	[illegible]	[illegible]						Total Number of Containers	Remarks/Matrix
(1) [illegible]		[illegible]	4-4-4			Y	Y						1.	[illegible]
		[illegible]	4-4-94											

Project Information	Sample Receipt	
Project Number: [illegible]	Total Number of Containers	
Project Name: [illegible]	COC Seals/Intact Y/N/NA	
Contact: [illegible]	Received Good Cond./Cold	
Ongoing Project? Yes ☑ No ☐	Delivery Method:	
Sampler: MSH	(attached shipping bill, if any)	

Instructions
Requested Turn Around Time: [illegible]
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [illegible] Time: [illegible]	Signature: Time:	Signature: Time:
Printed Name: [illegible] Date: 4-4-94	Printed Name: Date:	Printed Name: Date:
Company: [illegible] WILSON	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: [illegible] Time: [illegible]	Signature: Time:	Signature: Time:
Printed Name: [illegible] Date: [illegible]	Printed Name: Date:	Printed Name: Date:
Company: [illegible]	Company	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19 91/UR r9/92

0085

94.0076

Shannon & Wilson, Inc.

Chai ...stody Record

Page 1 of 1

Laboratory CITE

Attn: Mike Will

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

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St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
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Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 8020 BTEX	EPA 8021 DRO VPH						Total Number of Containers	Remarks/Matrix
(1) MW04-3-WS2		1:35	1/6/93			X	X						4	Steel upper right

Project Information	Sample Receipt	
Project Number: 7204-3	Total Number of Containers	1
Project Name: Correll's Ford	COC Seals/Intact Y/N/NA	
Contact: Susan Guhl	Received Good Cond./Cold	
Ongoing Project? Yes ☒ No ☐	Delivery Method:	
Sampler: Matt Stout	(attached shipping bill, if any)	

Instructions
Requested Turn Around Time: Norm
Special Instructions: FAX Perlon Results to 561-4483

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [signature] Time: 10:05	Signature: Time:	Signature: Time:
Printed Name: SUSAN GUHL Date: 1/7/94	Printed Name: Date:	Printed Name: Date:
Company: [illegible] WILSON	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: [signature] Time: [illegible]	Signature: Time:	Signature: Time:
Printed Name: [illegible] Date: [illegible]	Printed Name: Date:	Printed Name: Date:
Company: [illegible]	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

0086

Shannon & Wilson, Inc.

Chain of Custody Record

Page 1 of 1

Laboratory CT+E

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Analysis Parameters/Sample Container Description
(include preservative if used)

94.0106

	Sample Identity	Lab No.	Time	Date Sampled	Comp	Grab	EPA 602 BTEX	EPA 413.2 O&G + Grease	EPA 239.2 Diss Pb	Alaska Prichard Methods	EPA 5030/8015 GRO-VAPOR	EPA 8020 BTEX-VAPOR	Total Number of Containers	Remarks/Matrix
	~~Y204-3-BLMW~~						X	X	X	X			~~5~~	1, 1 liter amber glass 1, clear poly
(1)	Y204-3-B2MW		12:30	1/7/94			X	X	X	X			5	2, 40 ml VOA vials-HCl
(2)	TRIP BLANK		—	—			X						2	2 40 ml VOA vials-HCl
(3)	Y-204-3-VES3		12:35	1/7/94							1	1	1	Vapor Canister

Project Information	Sample Receipt
Project Number: Y204-3	Total Number of Containers
Project Name: Garrett's Texaco	COC Seals/Intact Y/N/NA
Contact: Susan Guhl	Received Good Cond./Cold
Ongoing Project? Yes ☒ No ☐	Delivery Method:
Sampler: MSH/SLG	(attached shipping bill, if any)

Instructions
Requested Turn Around Time: NORM
Special Instructions: NOTE: Pb/Metal Samples NOT FILTERED in Field

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [signature] Time: 13:00	Signature: Time:	Signature: Time:
Printed Name: MATT HAMER Date: 1/7/94	Printed Name: Date:	Printed Name: Date:
Company: SHANNON & WILSON	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: [signature] Time: 1300	Signature: Time:	Signature: Time:
Printed Name: JODY L. MAUS Date: 1/7/94	Printed Name: Date:	Printed Name: Date:
Company: CT+E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19.91/UR r9/92

1081

Shannon & Wilson, Inc.

Chain of Custody Record

Page 1 of 1

Laboratory

Attn:

94.0125

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(907) 561-2120
Fax (907) 561-4483

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab								Total Number of Containers	Remarks/Matrix
(1)	Y-204-[illegible]1504		[illegible]	[illegible]			X	X						1	Vapor Sampler
(2)	Y-204-5-VE-25		[illegible]	11/19/1			X	X						1	Vapor Sampler
(3)	Y-204-[illegible]		[illegible]	11/19/1			X	X						1	Vapor Sampler

Project Information		Sample Receipt	
Project Number:	1-204	Total Number of Containers	3
Project Name:	Gasoline	COC Seals/Intact Y/N/NA	
Contact:	[illegible]	Received Good Cond./Cold	
Ongoing Project? Yes ☐ No ☐		Delivery Method:	
Sampler:	[illegible]	(attached shipping bill, if any)	

Instructions
Requested Turn Around Time: [illegible]
Special Instructions: [illegible]

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [illegible] Time: 10:00	Signature: Time:	Signature: Time:
Printed Name: [illegible] Date: 11/19/91	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: [illegible] Time: 1004	Signature: Time:	Signature: Time:
Printed Name: [illegible] Date: 11/19/91	Printed Name: Date:	Printed Name: Date:
Company: CTE	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

1088

Chain of Custody Record

Shannon & Wilson, Inc.

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Page 1 of 1
Laboratory CTE
Attn:

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab				94.0165				Total Number of Containers	Remarks/Matrix

Project Information	Sample Receipt	
Project Number:	Total Number of Containers	
Project Name:	COC Seals/Intact Y/N/NA	
Contact:	Received Good Cond./Cold	
Ongoing Project? Yes ☐ No ☐	Delivery Method:	
Sampler:	(attached shipping bill, if any)	

Instructions
Requested Turn Around Time:
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 16:45	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

1089

Shannon & Wilson, Inc.

400 N. 34th Street, Suite 100
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Chain of Custody Record

94.0280

Page 1 of ____
Laboratory CT&E
Attn: ____

Analysis Parameters/Sample Container Description (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA [illegible] (GRO)	EPA [illegible] (BTEX)						Total Number of Containers	Remarks/Matrix
Y-204-3-VES8"		11:35	1/13/94		✓	1	1						1	Vapor canister

Project Information	Sample Receipt	
Project Number: Y-204-3	Total Number of Containers	1
Project Name: [illegible]	COC Seals/Intact Y/N/NA	
Contact:	Received Good Cond./Cold	
Ongoing Project? Yes ☑ No ☐	Delivery Method:	
Sampler:	(attached shipping bill, if any)	

Instructions

Requested Turn Around Time: [illegible]

Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [signature] Time: 16:55	Signature: Time:	Signature: Time:
Printed Name: [illegible] Date: [illegible]	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: [signature] Time: [illegible]	Signature: Time:	Signature: Time:
Printed Name: [illegible] Date: [illegible]	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

(1)

Shannon & Wilson, Inc.

Chain of Custody Record

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Fax (907) 561-4483

Page 1 of 1

Laboratory CTE

Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

94.0388

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 5030/8020 (BTEX)	EPA 8260 (BTEX)						Total Number of Containers	Remarks/Matrix
1	Y-204-3-VES9		13:00	1/25/94		X	1	1						1	Vapor Canister

Project Information		Sample Receipt	
Project Number:	Y-204-3	Total Number of Containers	1
Project Name:	Garrett's	COC Seals/Intact Y/N/NA	
Contact:	SUSAN GUHL	Received Good Cond./Cold	
Ongoing Project? Yes ☑ No ☐		Delivery Method:	
Sampler:	SUSAN GUHL	(attached shipping bill, if any)	

Instructions
Requested Turn Around Time: REGULAR
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan L Guhl Time: 14:00	Signature: Time:	Signature: Time:
Printed Name: SUSAN L. GUHL Date: 1/25/94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Joy L Maus Time: 1400	Signature: Time:	Signature: Time:
Printed Name: JOY L. MAUS Date: 1/25/94	Printed Name: Date:	Printed Name: Date:
Company: CTE	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

1091

Chain of Custody Record

Shannon & Wilson, Inc.

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Page 1 of 1
Laboratory CT&E
Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 5030/8015 GRO	EPA 8020 BTEX						Total Number of Containers	Remarks/Matrix
(1) Y-204-3-VES10'		13:15	2/3/94		1	1							1	Vapor Canister

Project Information		Sample Receipt	
Project Number:	Y-204-3	Total Number of Containers	1
Project Name:	GARRETT'S	COC Seals/Intact Y/N/NA	
Contact:	SUSAN GUHL	Received Good Cond./Cold	
Ongoing Project? Yes ☑ No ☐		Delivery Method:	
Sampler:	SUSAN GUHL	(attached shipping bill, if any)	

Instructions	
Requested Turn Around Time:	Regular
Special Instructions:	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [signature] Time: 2/3/55	Signature: Time:	Signature: Time:
Printed Name: SUSAN LYNN GUHL Date: 2/3/94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: [signature] Time: 1355	Signature: Time:	Signature: Time:
Printed Name: [illegible] Date: 2/3/94	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

0092

Shannon & Wilson, Inc.

Chain of Custody Record

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Laboratory CTE

Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

94.1089

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 8015 (GRO)	EPA 8020 BTEX						Total Number of Containers	Remarks/Matrix
(1)	1-204-3-WES-SW		1238	3/15/94		X	1	1						1	Vapor monitor

Project Information	Sample Receipt
Project Number: 1-204-3	Total Number of Containers
Project Name: Camp Lib	COC Seals/Intact Y/N/NA
Contact: Susan Cuhl	Received Good Cond./Cold
Ongoing Project? Yes ☑ No ☐	Delivery Method:
Sampler: Susan Cuhl	(attached shipping bill, if any)

Instructions
Requested Turn Around Time: Regular
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan Cuhl Time: 12:57	Signature: Time:	Signature: Time:
Printed Name: Susan L. Cuhl Date: 3/15/94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 1261	Signature: Time:	Signature: Time:
Printed Name: Jody L Mavis Date: 3/16/94	Printed Name: Date:	Printed Name: Date:
Company: CTE	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

0093

Shannon & Wilson, Inc.

Chain of Custody Record

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Page 1 of 1
Laboratory CT&E
Attn:

94.1089

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 8015 GRO	EPA 8020 BTEX					Total Number of Containers	Remarks/Matrix
(1)	Y-204-3-VES-S11		12:38	3/15/94		X	1	1					1	Vapor canister

94.1089

Project Information		Sample Receipt	
Project Number: Y-204-3		Total Number of Containers	
Project Name: Garrett's		COC Seals/Intact Y/N/NA	
Contact: Susan Guhl		Received Good Cond./Cold	
Ongoing Project? Yes [X] No [ ]		Delivery Method:	
Sampler: Susan Guhl		(attached shipping bill, if any)	

Instructions
Requested Turn Around Time: Regular
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan L Guhl Time: 12:57	Signature: Time:	Signature: Time:
Printed Name: Susan L. Guhl Date: 3/15/94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Judy L Mays Time: 1257	Signature: Time:	Signature: Time:
Printed Name: Judy L. Mays Date: 3/15/94	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

3094

ANALYTICAL RESULTS FOR AMBIENT AIR BADGE SAMPLES

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.0718-1
Client Sample ID	Y204-3-AS1
Matrix	OTHER

Client Name	SHANNON & WILSON, INC.	WORK Order	75878	
Ordered By	MATT HEMRY	Printed Date	03/02/94	@ 13:38 hrs.
Project Name	GARRETT TESORO	Collected Date	02/16/94	@ hrs.
Project#	Y204-3	Received Date	02/16/94	@ 13:35 hrs.
PWSID	UA			

Technical Director: STEPHEN C. EDE

Released By: Stephen C Ede

Sample Remarks: SAMPLE COLLECTED BY: M.S.H. MATRIX = 3M 3520 ORGANIC VAPOR BADGE. TOTAL RUN: 3010 MIN. CONTAMINATION FOUND IN SECONDARY IS LESS THAN 50% OF THAT IN PRIMARY.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.166		ppm	EPA 5030/8015m		02/28/94	02/28/94	MDU

Benzene	0.0096		ppm	EPA 8020		02/28/94	02/28/94	MDU
Toluene	0.0209		ppm	EPA 8020		02/28/94	02/28/94	MDU
Ethylbenzene	0.0032		ppm	EPA 8020		02/28/94	02/28/94	MDU
p&m Xylene	0.0123		ppm	EPA 8020		02/28/94	02/28/94	MDU
o-Xylene	0.0040		ppm	EPA 8020		02/28/94	02/28/94	MDU
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.0653		mg	EPA 5030/8015m		02/28/94	02/28/94	MDU

Benzene	0.0031		mg	EPA 8020		02/28/94	02/28/94	MDU
Toluene	0.0073		mg	EPA 8020		02/28/94	02/28/94	MDU
Ethylbenzene	0.0011		mg	EPA 8020		02/28/94	02/28/94	MDU
p&m Xylene	0.0044		mg	EPA 8020		02/28/94	02/28/94	MDU
o-Xylene	0.0014		mg	EPA 8020		02/28/94	02/28/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.
UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.0718-2
Client Sample ID	Y204-3-AS2
Matrix	OTHER

Client Name	SHANNON & WILSON, INC.	WORK Order	75878	
Ordered By	MATT HEMRY	Printed Date	03/02/94 @ 16:29	hrs.
Project Name	GARRETT TESORO	Collected Date	02/16/94 @	hrs.
Project#	Y204-3	Received Date	02/16/94 @ 13:35	hrs.
PWSID	UA			

Technical Director: STEPHEN C. EDE

Released By: Stephen C Ede

Sample Remarks: SAMPLE COLLECTED BY: M.S.H. MATRIX = 3M3520 ORGANIC VAPOR BADGE. TOTAL RUN: 3010 MIN. CONTAMINATION FOUND IN SECONDARY IS LESS THAN 50% OF THAT IN PRIMARY.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.328		ppm	EPA 5030/8015m		02/28/94	02/28/94	MDU

Benzene	0.0156		ppm	EPA 8020		02/28/94	02/28/94	MDU
Toluene	0.0326		ppm	EPA 8020		02/28/94	02/28/94	MDU
Ethylbenzene	0.0050		ppm	EPA 8020		02/28/94	02/28/94	MDU
p&m Xylene	0.0169		ppm	EPA 8020		02/28/94	02/28/94	MDU
o-Xylene	0.0059		ppm	EPA 8020		02/28/94	02/28/94	MDU
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.0129		mg	EPA 5030/8015m		02/28/94	02/28/94	MDU

Benzene	0.0051		mg	EPA 8020		02/28/94	02/28/94	MDU
Toluene	0.0114		mg	EPA 8020		02/28/94	02/28/94	MDU
Ethylbenzene	0.0017		mg	EPA 8020		02/28/94	02/28/94	MDU
p&m Xylene	0.0060		mg	EPA 8020		02/28/94	02/28/94	MDU
o-Xylene	0.0021		mg	EPA 8020		02/28/94	02/28/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.0718-3
Client Sample ID	Y204-3-AS3
Matrix	OTHER

Client Name	SHANNON & WILSON, INC.	WORK Order	75878	
Ordered By	MATT HEMRY	Printed Date	03/02/94	@ 13:38 hrs.
Project Name	GARRETT TESORO	Collected Date	02/16/94	@ hrs.
Project#	Y204-3	Received Date	02/16/94	@ 13:35 hrs.
PWSID	UA			

Technical Director: STEPHEN C. EDE

Released By: Stephen C Ede

Sample Remarks: SAMPLE COLLECTED BY: M.S.H. MATRIX = 3M 3520 ORGANIC VAPOR BADGE. TOTAL RUN: 3010 MIN. CONTAMINATION FOUND IN SECONDARY IS LESS THAN 50% OF THAT IN PRIMARY.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.256		ppm	EPA 5030/8015m		02/28/94	02/28/94	MDU

Benzene	0.0077		ppm	EPA 8020		02/28/94	02/28/94	MDU
Toluene	0.0189		ppm	EPA 8020		02/28/94	02/28/94	MDU
Ethylbenzene	0.0034		ppm	EPA 8020		02/28/94	02/28/94	MDU
p&m Xylene	0.0111		ppm	EPA 8020		02/28/94	02/28/94	MDU
o-Xylene	0.0038		ppm	EPA 8020		02/28/94	02/28/94	MDU
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.100		mg	EPA 5030/8015m		02/28/94	02/28/94	MDU

Benzene	0.0025		mg	EPA 8020		02/28/94	02/28/94	MDU
Toluene	0.0066		mg	EPA 8020		02/28/94	02/28/94	MDU
Ethylbenzene	0.0011		mg	EPA 8020		02/28/94	02/28/94	MDU
p&m Xylene	0.0039		mg	EPA 8020		02/28/94	02/28/94	MDU
o-Xylene	0.0013		mg	EPA 8020		02/28/94	02/28/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.0718-4
Client Sample ID	Y204-3-AS4
Matrix	OTHER

Client Name	SHANNON & WILSON, INC.	WORK Order	75878	
Ordered By	MATT HEMRY	Printed Date	03/02/94	@ 13:39 hrs.
Project Name	GARRETT TESORO	Collected Date	02/16/94	@ hrs.
Project#	Y204-3	Received Date	02/16/94	@ 13:35 hrs.
PWSID	UA			

Technical Director: STEPHEN C. EDE

Released By: Stephen C Ede

Sample Remarks: SAMPLE COLLECTED BY: M.S.H. MATRIX = 3M3520 ORGANIC VAPOR BADGE. TOTAL RUN: 3010 MIN. CONTAMINATION FOUND IN SECONDARY IS LESS THAN 50% OF THAT IN PRIMARY.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.166		ppm	EPA 5030/8015m		03/01/94	03/01/94	MDU

Benzene	0.0105		ppm	EPA 8020		03/01/94	03/01/94	MDU
Toluene	0.0234		ppm	EPA 8020		03/01/94	03/01/94	MDU
Ethylbenzene	0.0046		ppm	EPA 8020		03/01/94	03/01/94	MDU
p&m Xylene	0.0141		ppm	EPA 8020		03/01/94	03/01/94	MDU
o-Xylene	0.0050		ppm	EPA 8020		03/01/94	03/01/94	MDU
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.0654		mg	EPA 5030/8015m		03/01/94	03/01/94	MDU

Benzene	0.0034		mg	EPA 8020		03/01/94	03/01/94	MDU
Toluene	0.0081		mg	EPA 8020		03/01/94	03/01/94	MDU
Ethylbenzene	0.0015		mg	EPA 8020		03/01/94	03/01/94	MDU
p&m Xylene	0.0050		mg	EPA 8020		03/01/94	03/01/94	MDU
o-Xylene	0.0018		mg	EPA 8020		03/01/94	03/01/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

94.0715

Shannon & Wilson, Inc.

Chain of Custody Record

Page 1 of 1

Laboratory CT+E

Attn: _____

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Total Run Time	Date Sampled	Comp.	Grab	EPA 8020 BTEX	EPA 8015 DRO						Total Number of Containers	3M Remarks/Matrix
(1)	Y204-3-AS1 ✓		300 min	2/16/94			X	X						1	3520 organic vapor Badge
(2)	Y204-3-AS2 ✓		300 min	2/16/94			X	X						1	"
(3)	Y204-3-AS3 ✓		2995 min	2/16/94			X	X						1	"
(4)	Y204-3-AS4 ✓		3006 min	2/16/94			X	X						1	"

Project Information		Sample Receipt	
Project Number: Y204-3		Total Number of Containers	
Project Name: Garrett Tesoro		COC Seals/Intact Y/N/NA	
Contact: Matt Hemley		Received Good Cond./Cold	
Ongoing Project? Yes ☒ No ☐		Delivery Method:	
Sampler: MSH		(attached shipping bill, if any)	

Instructions
Requested Turn Around Time: NORM
Special Instructions: FEB. 1994 Ambient Air Monitoring

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Matt H Time: 13:35	Signature: Time:	Signature: Time:
Printed Name: MATT HEMLEY Date: 2/16/94	Printed Name: Date:	Printed Name: Date:
Company: SHANNON & WILSON	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Douglas E. Van Pelt Time: 1335	Signature: Time:	Signature: Time:
Printed Name: Douglas E. Van Pelt Date: 2/16	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-19/92

C100

ANALYTICAL RESULTS FOR WATER TREATMENT SYSTEM

INFLUENT AND EFFLUENT WATER SAMPLES

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

0102

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :94.0063-1
Client Sample ID :Y204-3-WS1
Matrix :WATER

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S TESORO
Project# :Y-204-3
PWSID :UA

RUSH Order :74659
Report Completed :01/07/94
Collected :01/05/94 @ 13:45 hrs.
Received :01/05/94 @ 14:00 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: M.S.H. SAMPLE FILTERED AT LABORATORY 1-5-94 FOR DISSOLVED METALS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Aromatic Volatiles				EPA 602				
Benzene	25.5	D	mg/L	EPA 602		01/06	01/06	JLB
Toluene	19.6	D	mg/L	EPA 602		01/06	01/06	JLB
Ethylbenzene	1.85	D	mg/L	EPA 602		01/06	01/06	JLB
Chlorobenzene	0.100	U	mg/L	EPA 602		01/06	01/06	JLB
p & m Xylene	4.78	D	mg/L	EPA 602		01/06	01/06	JLB
o-Xylene	1.96	D	mg/L	EPA 602		01/06	01/06	JLB
1,4 Dichlorobenzene	0.100	U	mg/L	EPA 602		01/06	01/06	JLB
1,3 Dichlorobenzene	0.100	U	mg/L	EPA 602		01/06	01/06	JLB
1,2 Dichlorobenzene	0.100	U	mg/L	EPA 602		01/06	01/06	JLB
Dissolved Metals Analys	---			-				
Priority PollutantMetal				EPA				
Antimony	0.10	U	mg/L	EPA 200.7 ICP		01/06	01/06	DFL
Arsenic	0.018		mg/L	EPA 206.2 GF		01/06	01/07	BMW
Beryllium	0.050	U	mg/L	EPA 200.7 ICP		01/06	01/06	DFL
Cadmium	0.0005	U	mg/L	EPA 213.2 GF		01/06	01/06	MCE
Chromium (total)	0.005	U	mg/L	EPA 218.2 GF		01/06	01/06	MCE
Copper	0.050	U	mg/L	EPA 200.7 ICP		01/06	01/06	DFL
Lead	0.0058		mg/L	EPA 239.2 GF		01/06	01/06	MCE
Mercury	0.0002	U	mg/L	EPA 245.1		01/06	01/06	AFK
Nickel	0.050	U	mg/L	EPA 200.7 ICP		01/06	01/06	DFL
Selenium	0.005	U	mg/L	EPA 270.2		01/06	01/07	BMW
Silver	0.0010	U	mg/L	EPA 272.2 GF		01/06	01/07	KAW
Thallium	0.005	U	mg/L	EPA 279.2 GF		01/06	01/07	BMW
Zinc	0.068		mg/L	EPA 200.7 ICP		01/06	01/06	DFL
Oil & Grease(low level)	14.1		mg/L	EPA 413.2		01/06	01/06	DRS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

COMMERCIAL TESTING & ENGINEERING CO.
ENVIRONMENTAL LABORATORY SERVICES
SINCE 1908

)193

REPORT of ANALYSIS

5633 B STREET
ANCHORAGE, AK 99518
TEL: (907) 562-2343
FAX: (907) 561-5301

Chemlab Ref.# :94.0063-2
Client Sample ID :Y204-3-WS2
Matrix :WATER

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S TESORO
Project# :Y-204-3
PWSID :UA

RUSH Order :74659
Report Completed :01/07/94
Collected :01/05/94 @ 13:35 hrs.
Received :01/05/94 @ 14:00 hrs.
Technical Director:STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: M.S.H. SAMPLE FILTERED AT LABORATORY 1-5-94 FOR DISSOLVED METALS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Aromatic Volatiles				EPA 602				
Benzene	0.0029		mg/L	EPA 602		01/05	01/05	JLB
Toluene	0.0033		mg/L	EPA 602		01/05	01/05	JLB
Ethylbenzene	0.0010	U	mg/L	EPA 602		01/05	01/05	JLB
Chlorobenzene	0.0010	U	mg/L	EPA 602		01/05	01/05	JLB
p & m Xylene	0.0015		mg/L	EPA 602		01/05	01/05	JLB
o-Xylene	0.0010	U	mg/L	EPA 602		01/05	01/05	JLB
1,4 Dichlorobenzene	0.0010	U	mg/L	EPA 602		01/05	01/05	JLB
1,3 Dichlorobenzene	0.0010	U	mg/L	EPA 602		01/05	01/05	JLB
1,2 Dichlorobenzene	0.0010	U	mg/L	EPA 602		01/05	01/05	JLB
Dissolved Metals Analys	---			-				
Priority PollutantMetal				EPA				
Antimony	0.10	U	mg/L	EPA 200.7 ICP		01/06	01/06	DFL
Arsenic	0.0071		mg/L	EPA 206.2 GF		01/06	01/07	BMW
Beryllium	0.050	U	mg/L	EPA 200.7 ICP		01/06	01/06	DFL
Cadmium	0.0005	U	mg/L	EPA 213.2 GF		01/06	01/06	MCE
Chromium (total)	0.005	U	mg/L	EPA 218.2 GF		01/06	01/06	MCE
Copper	0.050	U	mg/L	EPA 200.7 ICP		01/06	01/06	DFL
Lead	0.0054		mg/L	EPA 239.2 GF		01/06	01/06	MCE
Mercury	0.0003		mg/L	EPA 245.1		01/06	01/06	AFK
Nickel	0.050	U	mg/L	EPA 200.7 ICP		01/06	01/06	DFL
Selenium	0.005	U	mg/L	EPA 270.2		01/06	01/07	BMW
Silver	0.0010	U	mg/L	EPA 272.2 GF		01/06	01/07	KAW
Thallium	0.005	U	mg/L	EPA 279.2 GF		01/06	01/07	BMW
Zinc	0.13		mg/L	EPA 200.7 ICP		01/06	01/06	DFL
Oil & Grease(low level)	0.84		mg/L	EPA 413.2		01/06	01/06	SMK

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

Chain of Custody Record

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Page 1 of 1

Laboratory [illegible]

Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	BTEX 602	[illegible]	[illegible]	[illegible]				Total Number of Containers	Remarks/Matrix
Y204-3-1051 (Surface)		15:15	1/5/94			X	X		X				5	
Y204-3-1052 (Middle)		13:35	1/5/94			X	X		X				5	

Project Information	Sample Receipt	
Project Number: Y204-3	Total Number of Containers	
Project Name: Barrells Inc.	COC Seals/Intact Y/N/NA	
Contact: Susan Gail	Received Good Cond./Cold	
Ongoing Project? Yes ☒ No ☐	Delivery Method:	
Sampler: [illegible]	(attached shipping bill, if any)	

Instructions

Requested Turn Around Time: Rush 24 hr

Special Instructions:
NONE. Pb & Metals Samples were NOT Filtered in the field

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [illegible] Time: 14:00	Signature: Time:	Signature: Time:
Printed Name: [illegible] Date: 1/5/94	Printed Name: Date:	Printed Name: Date:
Company: [illegible]	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: [illegible] Time: [illegible]	Signature: Time:	Signature: Time:
Printed Name: [illegible] Date: 1/5	Printed Name: Date:	Printed Name: Date:
Company: [illegible]	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

104

Commercial Testing & Engineering Co.
Environmental Laboratory Services
SINCE 1908

)105

REPORT of ANALYSIS

5633 B Street
Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

CT&E Ref.# :94.0599-2
Client Sample ID :Y-204-3-RW1-INFL.-S2
Matrix :WATER

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

RUSH Order :75670
Printed Date :02/09/94 @ 16:18 hrs.
Collected Date :02/08/94 @ 11:15 hrs.
Received Date :02/08/94 @ 12:12 hrs.
Technical Director :STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	9.71		mg/L	EPA 418.1		02/08	02/08	SMK
Aromatic Volatiles				EPA 602				
Benzene	21.6	D	mg/L	EPA 602		02/09	02/09	JLB
Toluene	16.5	D	mg/L	EPA 602		02/09	02/09	JLB
Ethylbenzene	1.57	D	mg/L	EPA 602		02/09	02/09	JLB
Chlorobenzene	0.100	U	mg/L	EPA 602		02/09	02/09	JLB
p & m Xylene	3.90	D	mg/L	EPA 602		02/09	02/09	JLB
o-Xylene	16.6	D	mg/L	EPA 602		02/09	02/09	JLB
1,4 Dichlorobenzene	0.100	U	mg/L	EPA 602		02/09	02/09	JLB
1,3 Dichlorobenzene	0.100	U	mg/L	EPA 602		02/09	02/09	JLB
1,2 Dichlorobenzene	0.100	U	mg/L	EPA 602		02/09	02/09	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.
Environmental Laboratory Services

5633 B Street
Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

0106

REPORT of ANALYSIS

CT&E Ref.# :94.0599-1
Client Sample ID :Y-204-3-RW1-EFFL.-S2
Matrix :WATER

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

RUSH Order :75670
Printed Date :02/16/94 @ 09:29 hrs.
Collected Date :02/08/94 @ 11:10 hrs.
Received Date :02/08/94 @ 12:12 hrs.
Technical Director :STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. TAG FOR MOA PRETREATMENT MARKED SAMPLED AT 1115 HRS. FINAL RESULTS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	0.20	U	mg/L	EPA 418.1		02/08	02/08	SMK
Aromatic Volatiles				EPA 602				
Benzene	0.0020		mg/L	EPA 602		02/08	02/08	JLB
Toluene	0.0023		mg/L	EPA 602		02/08	02/08	JLB
Ethylbenzene	0.0010	U	mg/L	EPA 602		02/08	02/08	JLB
Chlorobenzene	0.0010	U	mg/L	EPA 602		02/08	02/08	JLB
p & m Xylene	0.0019		mg/L	EPA 602		02/08	02/08	JLB
o-Xylene	0.0010	U	mg/L	EPA 602		02/08	02/08	JLB
1,4 Dichlorobenzene	0.0010	U	mg/L	EPA 602		02/08	02/08	JLB
1,3 Dichlorobenzene	0.0010	U	mg/L	EPA 602		02/08	02/08	JLB
1,2 Dichlorobenzene	0.0010	U	mg/L	EPA 602		02/08	02/08	JLB
MOA Wastewater Pretreat				EPA, SM				
Arsenic	0.05	U	mg/L	EPA 206.2	10	02/09	02/10	BMW
Cadmium	0.025	U	mg/L	EPA 213.2	1.0	02/09	02/10	TJV
Chromium	0.025	U	mg/L	SM 305	10	02/09	02/10	TJV
Chromium-Hexavalent	1.0	U	mg/L	SM 312B	4.0		02/09	DEV
Copper	0.025	U	mg/L	SM 305	0.3	02/09	02/10	DEV
Lead	0.050	U	mg/L	EPA 239.2/200.7	5.0	02/09	02/10	TJV
Mercury	0.0002	U	mg/L	SM 303F	0.002	02/10	02/10	AFK
Nickel	0.025	U	mg/L	SM 305	1.5	02/09	02/10	TJV
Silver	0.001	U	mg/L	EPA 272.2/200.7	0.02	02/09	02/10	MCE
Zinc	0.35		mg/L	SM 305	9.0	02/09	02/10	MCE
BOD5	4		mg/L	SM 507	500	02/09	02/14	GPP
Suspended Solids	130		mg/L	SM 209C	1100	02/10	02/11	GPP
pH	8.1		units	SM 423	5-11	02/08	02/08	GPP
Oil & /Grease	0.34		mg/L	SM 503B	100	02/08	02/08	SMK
Cyanide	0.0050	U	mg/L	SM 412B	0.3	02/09	02/09	CMR

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

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Chain of Custody Record

Laboratory CT&E

Attn: ___

94.0599

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 418.1 TPH-RUSH	[illegible]	[illegible]	RUSHED				Total Number of Containers	Remarks/Matrix
	~~Y-204-3-EFF-02~~		11:10	2/8/94		X	1	1	1						Water
(1)	Y-204-3-RWI-Effl.	52													
	~~Y-204-3-[illegible]~~		11:15	2/8/94		X	1	1							Water
(2)	Y-204-3-RWI-Infl.	52													

Project Information	
Project Number:	Y-204-3
Project Name:	Gorrell's
Contact:	Susan Gokl
Ongoing Project? Yes ☐ No ☐	
Sampler:	Susan Gokl

Sample Receipt	
Total Number of Containers	
COC Seals/Intact Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attached shipping bill, if any)	

Instructions

Requested Turn Around Time: RUSH - TPH

Special Instructions: 3 samples [illegible] Pacer [illegible]

	Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature	Susan L. Gokl		
Time	12:12		
Printed Name	SUSAN LYNN GOKL		
Date	2/8/94		
Company	Shannon & Wilson		

	Received By: 1.	Received By: 2.	Received By: 3.
Signature	[illegible]		
Time	12:12		
Printed Name	Judy L. Mar[illegible]		
Date	2/8/94		
Company	CT&E		

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

Commercial Testing & Engineering Co.
Environmental Laboratory Services

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Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

0108

REPORT of ANALYSIS

CT&E Ref.# :94.0640-1
Client Sample ID :Y-204-3-RW1-INFL-S3
Matrix :WATER

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :75742
Printed Date :02/16/94 @ 14:55 hrs.
Collected Date :02/10/94 @ 10:00 hrs.
Received Date :02/10/94 @ 10:55 hrs.
Technical Director :STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	11.1		mg/L	EPA 418.1		02/11	02/11	SMK
VPH & BTEX				5030/8015M/602				
Hydrocarbons VPH	77.0	D	mg/L	EPA 5030/8015m		02/14	02/14	WLS
Benzene	21.9	D	mg/L	EPA 602		02/14	02/14	WLS
Toluene	16.4	D	mg/L	EPA 602		02/14	02/14	WLS
Ethylbenzene	1.48	D	mg/L	EPA 602		02/14	02/14	WLS
p & m Xylene	3.74	D	mg/L	EPA 602		02/14	02/14	WLS
o-Xylene	1.59	D	mg/L	EPA 602		02/14	02/14	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.
Environmental Laboratory Services

0109

REPORT of ANALYSIS

5633 B Street
Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

CT&E Ref.# :94.0639-1
Client Sample ID :Y-204-3-RW1-EFFL-S3
Matrix :WATER

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

RUSH Order :75740
Printed Date :02/16/94 @ 09:07 hrs.
Collected Date :02/10/94 @ 10:05 hrs.
Received Date :02/10/94 @ 10:55 hrs.
Technical Director :STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. FINAL RESULTS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	0.20	U	mg/L	EPA 418.1		02/10	02/10	SMK
Aromatic Volatiles				EPA 602				
Benzene	0.014		mg/L	EPA 602		02/11	02/11	JLB
Toluene	0.011		mg/L	EPA 602		02/11	02/11	JLB
Ethylbenzene	0.0010		mg/L	EPA 602		02/11	02/11	JLB
Chlorobenzene	0.0010	U	mg/L	EPA 602		02/11	02/11	JLB
p & m Xylene	0.0032		mg/L	EPA 602		02/11	02/11	JLB
o-Xylene	0.0016		mg/L	EPA 602		02/11	02/11	JLB
1,4 Dichlorobenzene	0.0010	U	mg/L	EPA 602		02/11	02/11	JLB
1,3 Dichlorobenzene	0.0010	U	mg/L	EPA 602		02/11	02/11	JLB
1,2 Dichlorobenzene	0.0010	U	mg/L	EPA 602		02/11	02/11	JLB
MOA Wastewater Pretreat				EPA, SM				
Arsenic	0.015		mg/L	EPA 206.2	10	02/11	02/14	BMW
Cadmium	0.025	U	mg/L	EPA 213.2	1.0	02/11	02/11	DFL
Chromium	0.025	U	mg/L	SM 305	10	02/11	02/11	DFL
Chromium-Hexavalent	1.0	U	mg/L	SM 312B	4.0		02/11	DEV
Copper	0.025	U	mg/L	SM 305	0.3	02/11	02/11	DFL
Lead	0.050	U	mg/L	EPA 239.2/200.7	5.0	02/11	02/11	DFL
Mercury	0.0002	U	mg/L	SM 303F	0.002	02/14	02/14	AFK
Nickel	0.025	U	mg/L	SM 305	1.5	02/11	02/11	DFL
Silver	0.001	U	mg/L	EPA 272.2/200.7	0.02	02/11	02/14	MCE
Zinc	0.31		mg/L	SM 305	9.0	02/11	02/14	KAW
BOD5	1		mg/L	SM 507	500	02/10	02/15	GPP
Suspended Solids	32		mg/L	SM 209C	1100		02/14	
pH	7.9		units	SM 423	5-11		02/10	GPP
Oil & /Grease	0.2	U	mg/L	SM 503B	100	02/10	02/10	
Cyanide	0.0050	U	mg/L	SM 412B	0.3	02/14	02/14	CMR

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
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LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

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Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 418.1 TPH							Total Number of Containers	Remarks/Matrix
(1) Y-204-3-Rw1-TnC1-S3		10:00	2/4/94		X	1	1	1					4	water

Project Information	Sample Receipt
Project Number: Y-204-3	Total Number of Containers
Project Name: Cypress	COC Seals/Intact Y/N/NA
Contact: Susan Guill	Received Good Cond./Cold
Ongoing Project? Yes ☑ No ☐	Delivery Method:
Sampler: Susan Guill	(attached shipping bill, if any)

Instructions

Requested Turn Around Time: Normal

Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 12:55	Signature: Time:	Signature: Time:
Printed Name: Susan L. Guill Date: 2/4/94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

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Shannon & Wilson, Inc.

Chain of Custody Record

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Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Total Number of Containers	Remarks/Matrix
(1)	Y-204-S-RW1-GW1-33		10	2/10/94		X	1	1	1						WATER

Project Information		Sample Receipt	
Project Number: Y-204-3		Total Number of Containers	
Project Name: Gasoline		COC Seals/Intact Y/N/NA	
Contact: [illegible]		Received Good Cond./Cold	
Ongoing Project? Yes ☒ No ☐		Delivery Method:	
Sampler: [illegible]		(attached shipping bill, if any)	

Instructions	
Requested Turn Around Time:	[illegible]
Special Instructions:	[illegible]

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [illegible] Time: [illegible]	Signature: Time:	Signature: Time:
Printed Name: [illegible] Date: 2/10/94	Printed Name: Date:	Printed Name: Date:
Company: [illegible]	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: [illegible] Time: [illegible]	Signature: Time:	Signature: Time:
Printed Name: [illegible] Date: [illegible]	Printed Name: Date:	Printed Name: Date:
Company: [illegible]	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.0752-1
Client Sample ID	Y204-3-RW1INF1-S4
Matrix	WATER

Client Name	SHANNON & WILSON, INC.	WORK Order	75944	
Ordered By	MATT HEMRY	Printed Date	02/28/94	@ 15:48 hrs.
Project Name	Y204-3	Collected Date	02/18/94	@ 11:35 hrs.
Project#	GARRETT'S	Received Date	02/18/94	@ 12:15 hrs.
PWSID	UA			

Technical Director STEPHEN C. EDE

Released By: Stephen C Ede

Sample Remarks: SAMPLE COLLECTED BY: M.S.H.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	8.11		mg/L	EPA 418.1		02/22/94	02/22/94	SMK
Aromatic Volatiles				EPA 602				
Benzene	15.9	D	mg/L	EPA 602		02/24/94	02/24/94	JLB
Toluene	12.3	D	mg/L	EPA 602		02/24/94	02/24/94	JLB
Ethylbenzene	1.04	D	mg/L	EPA 602		02/24/94	02/24/94	JLB
Chlorobenzene	0.100	U	mg/L	EPA 602		02/24/94	02/24/94	JLB
p & m Xylene	2.64	D	mg/L	EPA 602		02/24/94	02/24/94	JLB
o-Xylene	1.18	D	mg/L	EPA 602		02/24/94	02/24/94	JLB
1,4 Dichlorobenzene	0.100	U	mg/L	EPA 602		02/24/94	02/24/94	JLB
1,3 Dichlorobenzene	0.100	U	mg/L	EPA 602		02/24/94	02/24/94	JLB
1,2 Dichlorobenzene	0.100	U	mg/L	EPA 602		02/24/94	02/24/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected. Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.0752-2
Client Sample ID	Y204-3-RW1EFF1-S4
Matrix	WATER

Client Name	SHANNON & WILSON, INC.	WORK Order	75944	
Ordered By	MATT HEMRY	Printed Date	02/28/94	@ 16:19 hrs.
Project Name	Y204-3	Collected Date	02/18/94	@ 11:30 hrs.
Project#	GARRETTS	Received Date	02/18/94	@ 12:15 hrs.
PWSID	UA			

Technical Director STEPHEN C. EDE

Released By: Stephen C Ede

Sample Remarks: SAMPLE COLLECTED BY: M.S.H.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	0.21		mg/L	EPA 418.1		02/22/94	02/22/94	SMK
Aromatic Volatiles				EPA 602				
Benzene	0.0062		mg/L	EPA 602		02/23/94	02/23/94	JLB
Toluene	0.0072		mg/L	EPA 602		02/23/94	02/23/94	JLB
Ethylbenzene	0.0011		mg/L	EPA 602		02/23/94	02/23/94	JLB
Chlorobenzene	0.0010	U	mg/L	EPA 602		02/23/94	02/23/94	JLB
p & m Xylene	0.0039		mg/L	EPA 602		02/23/94	02/23/94	JLB
o-Xylene	0.0024		mg/L	EPA 602		02/23/94	02/23/94	JLB
1,4 Dichlorobenzene	0.0010	U	mg/L	EPA 602		02/23/94	02/23/94	JLB
1,3 Dichlorobenzene	0.0010	U	mg/L	EPA 602		02/23/94	02/23/94	JLB
1,2 Dichlorobenzene	0.0010	U	mg/L	EPA 602		02/23/94	02/23/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
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GT = Greater Than

Shannon & Wilson, Inc.

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Analysis Parameters/Sample Container Description
(include preservative if used)

94.0752

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 602 BTEX	EPA 418.1 TPH					Total Number of Containers	Remarks/Matrix
(1)	Y204-3-RWINF1-S4		11:35	2/10/94			X	X					2	2,40ml VOA vial (HCl) 1 liter Amber glass (none)
(2)	Y204-3-RWIEFF1-S4		11:30	"			X	X					2	"

94.0752

Project Information	Sample Receipt
Project Number: Y204-3	Total Number of Containers
Project Name: Garrett's	COC Seals/Intact Y/N/NA
Contact: Matt Henry	Received Good Cond./Cold
Ongoing Project? Yes ☒ No ☐	Delivery Method:
Sampler: MAH	(attached shipping bill, if any)

Instructions
Requested Turn Around Time: Norm
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 12:15	Signature: Time:	Signature: Time:
Printed Name: MATT HENRY Date: 2/10/94	Printed Name: Date:	Printed Name: Date:
Company: SHANNON & WILSON	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 12/5	Signature: Time:	Signature: Time:
Printed Name: Joy L. Maus Date: 2/12/94	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

0114

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.0806-1
Client Sample ID	Y204-3-RW1-INFL-S5
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	MATT HEMRY
Project Name	GARRETT'S TESORO
Project#	Y204-3
PWSID	UA

WORK Order	76050		
Printed Date	03/01/94	@11:22	hrs.
Collected Date	02/23/94	@13:55	hrs.
Received Date	02/23/94	@16:15	hrs.

Technical Director STEPHEN C. EDE

Released By: Stephen C Ede

Sample Remarks: SAMPLE COLLECTED BY: M.S.H.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	8.54		mg/L	EPA 418.1		02/25/94	02/25/94	SMK
Aromatic Volatiles				EPA 602				
Benzene	15.1	D	mg/L	EPA 602		02/28/94	02/28/94	JLB
Toluene	11.8	D	mg/L	EPA 602		02/28/94	02/28/94	JLB
Ethylbenzene	1.00	D	mg/L	EPA 602		02/28/94	02/28/94	JLB
p & m Xylene	2.50	D	mg/L	EPA 602		02/28/94	02/28/94	JLB
o-Xylene	1.10	D	mg/L	EPA 602		02/28/94	02/28/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

SINCE 1908

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.0806-2
Client Sample ID	Y204-3-RW1-EFFL-S5
Matrix	WATER

Client Name	SHANNON & WILSON, INC.	WORK Order	76050	
Ordered By	MATT HEMRY	Printed Date	03/01/94	@ 11:22 hrs.
Project Name	GARRETT'S TESORO	Collected Date	02/23/94	@ 13:45 hrs.
Project#	Y204-3	Received Date	02/23/94	@ 16:15 hrs.
PWSID	UA			

Technical Director STEPHEN C. EDE

Released By: Stephen C Ede

Sample Remarks: SAMPLE COLLECTED BY: M.S.H. SAMPLE ALSO APPEARS TO CONTAIN 0.014 MG/L OF 1,2-DICHLOROETHANE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	0.26		mg/L	EPA 418.1		02/25/94	02/25/94	SMK
Aromatic Volatiles				EPA 602				
Benzene	0.691	D	mg/L	EPA 602		02/28/94	02/28/94	JLB
Toluene	0.549	D	mg/L	EPA 602		02/28/94	02/28/94	JLB
Ethylbenzene	0.042		mg/L	EPA 602		02/26/94	02/26/94	JLB
p & m Xylene	0.108		mg/L	EPA 602		02/26/94	02/26/94	JLB
o-Xylene	0.050		mg/L	EPA 602		02/26/94	02/26/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
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Page 1 of 1
Laboratory CT E
Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

94.0806

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 602 BTEX	EPA 418.1 TPH						Total Number of Containers	Remarks/Matrix
(1)	Y204-3-RW1-FWL-S5		13:55	7/23/94			X	X						3	2,40 ml VOA vial (HCL) 1 liter Amber glass (none)
(2)	Y204-3-RW1-Effl-S5		13:45	"			X	X						3	"

Project Information		Sample Receipt	
Project Number:	Y204-3	Total Number of Containers	
Project Name:	Garrett Tesoro	COC Seals/Intact Y/N/NA	
Contact:	Matt Hemry	Received Good Cond./Cold	
Ongoing Project?	Yes ☒ No ☐	Delivery Method:	
Sampler:	MKH	(attached shipping bill, if any)	

Instructions

Requested Turn Around Time: NORM

Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Matt H Time: 16:15	Signature: Time:	Signature: Time:
Printed Name: MATT HEMRY Date: 2/23/94	Printed Name: Date:	Printed Name: Date:
Company: SHANNON & WILSON	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Judy L Mays Time: 1615	Signature: Time:	Signature: Time:
Printed Name: JUDY L. MAYS Date: 2/23/94	Printed Name: Date:	Printed Name: Date:
Company: CT & E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

0117

Commercial Testing & Engineering Co.
Environmental Laboratory Services
SINCE 1909

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.1022-1
Client Sample ID	Y204-3-RW1-S6-INFL
Matrix	WATER

Client Name	SHANNON & WILSON, INC.	WORK Order	76467	
Ordered By	MATT HEMRY	Printed Date	03/18/94	@ 16:21 hrs.
Project Name	GARRETT TESORO	Collected Date	03/10/94	@ 13:05 hrs.
Project#	Y204-3	Received Date	03/10/94	@ 13:15 hrs.
PWSID	UA			
		Technical Director	STEPHEN C. EDE	
		Released By:	Stephen C Ede	

Sample Remarks: SAMPLE COLLECTED BY: M.S.H.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Iron Bacteria	NEGATIVE			SM		03/10/94	03/18/94	GPP

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.1022-2
Client Sample ID	Y204-3-RW1-S6-EFFL
Matrix	WATER

Client Name	SHANNON & WILSON, INC.	WORK Order	76467	
Ordered By	MATT HEMRY	Printed Date	03/18/94	@ 16:21 hrs.
Project Name	GARRETT TESORO	Collected Date	03/10/94	@ 13:00 hrs.
Project#	Y204-3	Received Date	03/10/94	@ 13:15 hrs.
PWSID	UA	Technical Director	STEPHEN C. EDE	

Released By: Stephen C Ede

Sample Remarks: SAMPLE COLLECTED BY: M.S.H.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Iron Bacteria	NEGATIVE			SM		03/10/94	03/18/94	GPP

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

Chain of Custody Record

Page 1 of 1

Laboratory CTAF

Attn: _____

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Analysis Parameters/Sample Container Description
(include preservative if used)

94.1022

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	Fe Spectrum							Total Number of Containers	Remarks/Matrix
Y204-3-RWI-SW-Init		15:05	5/10/94			X							1	250 ml PP/Stabilized
Y204-3-RWI-SW-Fill		13:00	5/10/94			X							1	"

Project Information	Sample Receipt
Project Number: Y204-3	Total Number of Containers
Project Name: Garrett Tract	COC Seals/Intact Y/N/NA
Contact: Matt Hemry	Received Good Cond./Cold
Ongoing Project? Yes ☑ No ☐	Delivery Method:
Sampler: Matt	(attached shipping bill, if any)

Instructions
Requested Turn Around Time: 7 days
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 15:15	Signature: Time:	Signature: Time:
Printed Name: Matt Hemry Date: 5/10/94	Printed Name: Date:	Printed Name: Date:
Company: S-4 W	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time: 15:15	Signature: Time:	Signature: Time:
Printed Name: Jerry L. Mau Date: 5/10/94	Printed Name: Date:	Printed Name: Date:
Company: CTAF	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

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Commercial Testing & Engineering Co.
Environmental Laboratory Services

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LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.1018-2
Client Sample ID	Y204-3-RW1-S6-INFL
Matrix	WATER

Client Name	SHANNON & WILSON, INC.	RUSH Order	76457	
Ordered By	MATT HEMRY	Printed Date	03/11/94	@16:22 hrs.
Project Name	GARRETT'S TESORO	Collected Date	03/10/94	@11:15 hrs.
Project#	Y204-3	Received Date	03/10/94	@11:40 hrs.
PWSID	UA	Technical Director	STEPHEN C. EDE	

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: M.S.H.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	9.28		mg/L	EPA 418.1		03/10/94	03/10/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	13.1	D	mg/L	EPA 602 18AAC78		03/11/94	03/11/94	WLS
Toluene	10.6	D	mg/L	EPA 602 18AAC78		03/11/94	03/11/94	WLS
Ethylbenzene	0.972	D	mg/L	EPA 602 18AAC78		03/11/94	03/11/94	WLS
p&m Xylene	2.49	D	mg/L	EPA 602 18AAC78		03/11/94	03/11/94	WLS
o-Xylene	1.09	D	mg/L	EPA 602 18AAC78		03/11/94	03/11/94	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

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Commercial Testing & Engineering Co.

Environmental Laboratory Services

0122

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.1018-1
Client Sample ID	Y204-3-RW1-S6-EFFL
Matrix	WATER

Client Name	SHANNON & WILSON, INC.	RUSH Order	76457	
Ordered By	MATT HEMRY	Printed Date	03/14/94	@ 09:35 hrs.
Project Name	GARRETT'S TESORO	Collected Date	03/10/94	@ 11:00 hrs.
Project#	Y204-3	Received Date	03/10/94	@ 11:40 hrs.
PWSID	UA			

Technical Director STEPHEN C. EDE

Released By: Stephen C Ede

Sample Remarks: SAMPLE COLLECTED BY: M.S.H. J = INDICATES AN ANALYTE WHOSE CONCENTRATION IS ESTIMATED BECAUSE THE ANALYTE'S CONCENTRATION IS DETECTED BELOW THE CALIBRATION RANGE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	0.20	U	mg/L	EPA 418.1		03/10/94	03/10/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	0.00098	J	mg/L	EPA 602 18AAC78		03/11/94	03/11/94	WLS
Toluene	0.0012		mg/L	EPA 602 18AAC78		03/11/94	03/11/94	WLS
Ethylbenzene	0.0010	U	mg/L	EPA 602 18AAC78		03/11/94	03/11/94	WLS
p&m Xylene	0.0010	U	mg/L	EPA 602 18AAC78		03/11/94	03/11/94	WLS
o-Xylene	0.0010	U	mg/L	EPA 602 18AAC78		03/11/94	03/11/94	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

5633 B Street, **Anchorage, AK 99518-1600** — Tel: (907) 562-2343 Fax: (907) 561-5301

Shannon & Wilson, Inc.

Chain of Custody Record

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Anchorage, AK 99518
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Page 1 of 1
Laboratory CT+E
Attn: _____

74.1018

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 602 BTEX	EPA 418.1 TPH						Total Number of Containers	Remarks/Matrix
(1)	Y204-3-RW1-S6-Eff1		11:00	3/10/94			X	X						4	2 40 ml VOA vials (HCl)
															2 1 liter Amber glass (none)
(2)	Y204-3-RW1-S6-INFL		11:15	3/10/94			X	X						3	2 40 ml VOA (HCl)
															1 1 liter Amber glass (HCl)

Project Information		Sample Receipt	
Project Number:	Y204-3	Total Number of Containers	
Project Name:	Garrett Tesoro	COC Seals/Intact Y/N/NA	
Contact:	Matt Hemry	Received Good Cond./Cold	
Ongoing Project?	Yes ☒ No ☐	Delivery Method:	
Sampler:	MSH	(attached shipping bill, if any)	

Instructions

Requested Turn Around Time:

Special Instructions: 24-HR RUSH

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 11:40	Signature: Time:	Signature: Time:
Printed Name: MATT HEMRY Date: 3/10/94	Printed Name: Date:	Printed Name: Date:
Company: SHANNON & WILSON	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time: 1140	Signature: Time:	Signature: Time:
Printed Name: JODY L. MAUS Date: 3/10/94	Printed Name: Date:	Printed Name: Date:
Company: CT+E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

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Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.1142-1
Client Sample ID	Y-204-3-INFL-S7
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y-204-3
PWSID	UA

WORK Order	76701		
Printed Date	04/05/94	@09:06	hrs.
Collected Date	03/18/94	@09:15	hrs.
Received Date	03/18/94	@09:55	hrs.

Technical Director STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	6.61		mg/L	EPA 418.1		03/31/94	03/31/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	11.8	D	mg/L	EPA 602 18AAC78		03/31/94	03/31/94	WLS
Toluene	8.93	D	mg/L	EPA 602 18AAC78		03/31/94	03/31/94	WLS
Ethylbenzene	0.782	D	mg/L	EPA 602 18AAC78		03/31/94	03/31/94	WLS
p&m Xylene	1.96	D	mg/L	EPA 602 18AAC78		03/31/94	03/31/94	WLS
o-Xylene	0.861	D	mg/L	EPA 602 18AAC78		03/31/94	03/31/94	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

SINCE 1908

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.1142-2
Client Sample ID	Y-204-3-EFFL-S7
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y-204-3
PWSID	UA

WORK Order	76701		
Printed Date	04/05/94	@09:06	hrs.
Collected Date	03/18/94	@09:30	hrs.
Received Date	03/18/94	@09:55	hrs.

Technical Director STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	0.20	U	mg/L	EPA 418.1		03/31/94	03/31/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	0.0010	U	mg/L	EPA 602 18AAC78		03/31/94	03/31/94	WLS
Toluene	0.0010	U	mg/L	EPA 602 18AAC78		03/31/94	03/31/94	WLS
Ethylbenzene	0.0010	U	mg/L	EPA 602 18AAC78		03/31/94	03/31/94	WLS
p&m Xylene	0.0010	U	mg/L	EPA 602 18AAC78		03/31/94	03/31/94	WLS
o-Xylene	0.0010	U	mg/L	EPA 602 18AAC78		03/31/94	03/31/94	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Chain of Custody Record

Shannon & Wilson, Inc.

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St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Page 1 of 1
Laboratory CT&E
Attn:

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time	Date Sampled	Comp	Grab	EPA 602 BTEX	EPA 418.1 TPH						Total Number of Containers	Remarks/Matrix
(1)	Y-204-3 Infl-57		9:15	3/18/94		X	1	1						3	2 ltr, 2 40ml
(2)	Y-204-3 Effl-57		9:30	3/18/94		X	1	1						3	2 ltr, 2 40ml

Project Information		Sample Receipt	
Project Number:	Y-204-3	Total Number of Containers	8
Project Name:	Garrett's	COC Seals/Intact Y/N/NA	
Contact:	Susan L. Guhl	Received Good Cond./Cold	
Ongoing Project? Yes ☑ No ☐		Delivery Method:	
Sampler:	Susan Guhl	(attached shipping bill, if any)	

Instructions	
Requested Turn Around Time:	Regular
Special Instructions:	

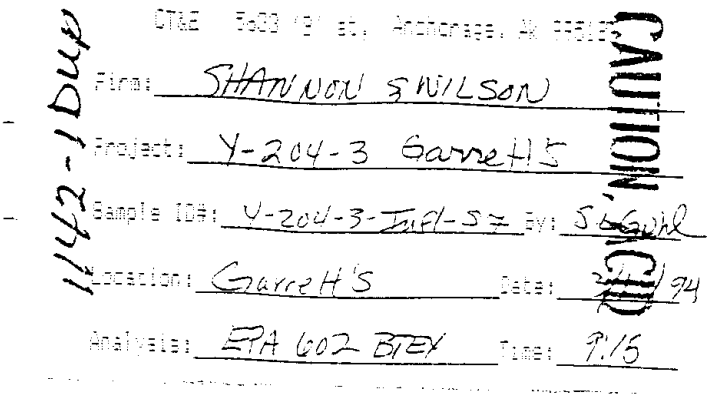
Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan L. Guhl Time: 0955	Signature: Time:	Signature: Time:
Printed Name: SUSAN L. GUHL Date: 3/18/94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

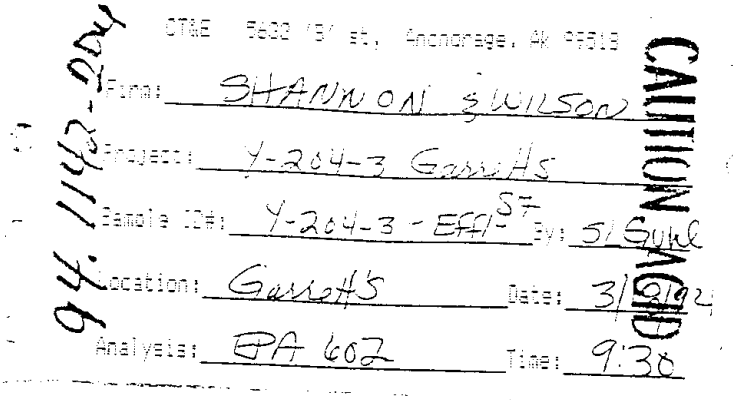
Received By: 1.	Received By: 2.	Received By: 3.
Signature: JR Warick Time: 0955	Signature: Time:	Signature: Time:
Printed Name: JR WARRICK Date: 3-18-94	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19.91/UR r9/92

0126


CAUTION, ACID
CT&E 5633 'B' st, Anchorage, Ak 99518
Firm: SHANNON & WILSON
Project: Y-204-3 Garrett S
Sample ID#: Y-204-3-Inf-S-2 By: S. Guhl
Location: Garrett S Date: 3/9/94
Analysis: EPA 602 BTEX Time: 9:15
11/42-1 Dup


CAUTION ACID
CT&E 5633 'B' st, Anchorage, Ak 99518
Firm: SHANNON & WILSON
Project: Y-204-3 Garrett S
Sample ID#: Y-204-3 - Eff-S-2 By: S. Guhl
Location: Garrett S Date: 3/9/94
Analysis: EPA 602 Time: 9:30
94. 11/42-2Dup

ANALYTICAL RESULTS FOR

GROUNDWATER MONITORING WELL SAMPLES

Commercial Testing & Engineering Co.
Environmental Laboratory Services
SINCE 1908

0129

REPORT of ANALYSIS

5633 B Street
Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

Chemlab Ref.# :94.0106-1
Client Sample ID :Y204-3-B2MWW1
Matrix :WATER

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S TESORO
Project# :Y204-3
PWSID :UA

WORK Order :74785
Report Completed :01/21/94
Collected :01/07/94 @ 12:30 hrs.
Received :01/07/94 @ 13:00 hrs.
Technical Director:STEPHEN C. EDE
Released By : C. Homestead

Sample Remarks: SAMPLE COLLECTED BY: M.S.H. AND S.L.G.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Oil & Grease IR	42.7		mg/L	EPA 413.2		01/07	01/07	SMK
Aromatic Volatiles				EPA 602				
Benzene	47.5	D	mg/L	EPA 602		01/19	01/19	WLS
Toluene	28.1	D	mg/L	EPA 602		01/19	01/19	WLS
Ethylbenzene	2.09	D	mg/L	EPA 602		01/19	01/19	WLS
p & m Xylene	5.37	D	mg/L	EPA 602		01/19	01/19	WLS
o-Xylene	2.65	D	mg/L	EPA 602		01/19	01/19	WLS
Dissolved Metals Analys	---			-				
Priority PollutantMetal				EPA				
Antimony	0.10	U	mg/L	EPA 200.7 ICP		01/10	01/12	KAW
Arsenic	0.0063		mg/L	EPA 206.2 GF		01/10	01/11	BMW
Beryllium	0.05	U	mg/L	EPA 200.7 ICP		01/10	01/12	KAW
Cadmium	0.0005	U	mg/L	EPA 213.2 GF		01/11	01/12	MCE
Chromium (total)	0.005	U	mg/L	EPA 218.2 GF		01/11	01/12	MCE
Copper	0.05	U	mg/L	EPA 200.7 ICP		01/10	01/12	KAW
Lead	0.15		mg/L	EPA 239.2 GF		01/11	01/11	MCE
Mercury	.0002	U	mg/L	EPA 245.1		01/17	01/17	AFK
Nickel	0.05	U	mg/L	EPA 200.7 ICP		01/10	01/12	KAW
Selenium	0.005	U	mg/L	EPA 270.2		01/10	01/11	BMW
Silver	0.0010	U	mg/L	EPA 272.2 GF		01/11	01/12	BMW
Thallium	0.005	U	mg/L	EPA 279.2 GF		01/11	01/11	BMW
Zinc	0.05	U	mg/L	EPA 200.7 ICP		01/10	01/12	KAW

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.
Environmental Laboratory Services
SINCE 1908

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Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

0130

REPORT of ANALYSIS

Chemlab Ref.# :94.0106-2
Client Sample ID :TRIP BLANK
Matrix :WATER

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S TESORO
Project# :Y204-3
PWSID :UA

WORK Order :74785
Report Completed :01/21/94
Collected : @ hrs.
Received :01/07/94 @ 13:00 hrs.
Technical Director:STEPHEN C. EDE
Released By : C. Homestead

Sample Remarks: SAMPLE COLLECTED BY: M.S.H. AND S.L.G. QC #60201010103.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Aromatic Volatiles				EPA 602				
Benzene	0.0010	U	mg/L	EPA 602		01/20	01/20	WLS
Toluene	0.0010	U	mg/L	EPA 602		01/20	01/20	WLS
Ethylbenzene	0.0010	U	mg/L	EPA 602		01/20	01/20	WLS
p & m Xylene	0.0010	U	mg/L	EPA 602		01/20	01/20	WLS
o-Xylene	0.0010	U	mg/L	EPA 602		01/20	01/20	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Chain of Custody Record

Shannon & Wilson, Inc.

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(907) 561-2120
Fax (907) 561-4483

Laboratory CLF

Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

54.0106

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	FPR 602 BTEX							Total Number of Containers	Remarks/Matrix
~~Y204-3-Blind~~						~~X~~								
Y204-3-B2MW2-S1		12:30	1/7/94			X	X		X				5	4 VOA vials - HCl
TRIP BLANK		—	—			X							2	2 VOA vials - HCl
Y-204-3-MW3		13:45	1/7/94							1	1		1	Water Sample - Ice

Project Information	Sample Receipt
Project Number: Y204-3	Total Number of Containers
Project Name: Garrett's Texaco	COC Seals/Intact Y/N/NA
Contact: Susan Gabel	Received Good Cond./Cold
Ongoing Project? Yes ☒ No ☐	Delivery Method:
Sampler: MSH/SLG	(attached shipping bill, if any)

Instructions

Requested Turn Around Time: NORMAL

Special Instructions:
NOTE: PL/Metal Samples NOT FILTERED in field

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 12:00	Signature: Time:	Signature: Time:
Printed Name: Date: 1/7/94	Printed Name: Date:	Printed Name: Date:
Company: SHANNON & WILSON	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

SINCE 1908

Commercial Testing & Engineering Co.

Environmental Laboratory Services

5633 B Street
Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

REPORT of ANALYSIS

CT&E Ref.# :94.0600-1
Client Sample ID :Y-204-3-B1MWW1
Matrix :WATER

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :75672
Printed Date :02/15/94 @ 14:04 hrs.
Collected Date :02/08/94 @ 11:20 hrs.
Received Date :02/08/94 @ 12:11 hrs.
Technical Director :STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUAN GUHL AND MATT HEMRY. EPH PATTERN NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL, MORE CONSISTENT WITH GASOLINE RANGE ORGANICS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Hydrocarbons EPH	3.96		mg/L	3510/3550/8100M		02/11	02/11	DRS
VPH & BTEX Hydrocarbons VPH	170	D	mg/L	5030/8015M/602 EPA 5030/8015m		02/14	02/14	WLS
Benzene	48.5	D	mg/L	EPA 602		02/14	02/14	WLS
Toluene	29.4	D	mg/L	EPA 602		02/14	02/14	WLS
Ethylbenzene	1.36	D	mg/L	EPA 602		02/14	02/14	WLS
p & m Xylene	5.89	D	mg/L	EPA 602		02/14	02/14	WLS
o-Xylene	1.77	D	mg/L	EPA 602		02/14	02/14	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.
Environmental Laboratory Services
SINCE 1908

0133

REPORT of ANALYSIS

5633 B Street
Anchorage, AK 99518-1600
Tel: (907) 562-2343
Fax: (907) 561-5301

CT&E Ref.# :94.0600-2
Client Sample ID :Y-204-3-B2MWW1A
Matrix :WATER

Client Name :SHANNON & WILSON, INC.
Ordered By :SUSAN GUHL
Project Name :GARRETT'S
Project# :Y-204-3
PWSID :UA

WORK Order :75672
Printed Date :02/15/94 @ 14:04 hrs.
Collected Date :02/08/94 @ 11:35 hrs.
Received Date :02/08/94 @ 12:11 hrs.
Technical Director :STEPHEN C. EDE
Released By :

Sample Remarks: SAMPLE COLLECTED BY: SUAN GUHL AND MATT HEMRY. EPH PATTERN NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL, MORE CONSISTENT WITH GASOLINE RANGE ORGANICS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Hydrocarbons EPH	1.39		mg/L	3510/3550/8100M		02/11	02/11	DRS
VPH & BTEX Hydrocarbons VPH	133	D	mg/L	5030/8015M/602 EPA 5030/8015m		02/14	02/14	WLS
Benzene	22.3	D	mg/L	EPA 602		02/14	02/14	WLS
Toluene	27.4	D	mg/L	EPA 602		02/14	02/14	WLS
Ethylbenzene	2.85	D	mg/L	EPA 602		02/14	02/14	WLS
p & m Xylene	9.85	D	mg/L	EPA 602		02/14	02/14	WLS
o-Xylene	2.20	D	mg/L	EPA 602		02/14	02/14	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

Chain of Custody Record

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8130

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Page 1 of _____
Laboratory CT&E
Attn: _____

94.0600

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 602 BTEX	EPA 8015 GRO	EPA 310M DRO					Total Number of Containers	Remarks/Matrix
(1)	~~Y-204-3-B1MW-S1~~		11:20	2/8/94		X	1	1	1						Water
	Y-204-3-B1MW W1														
*	~~Y-204-3-B2MW-S1A~~	-37	11:35	2/8/94		X	1	1	1						Water
(2)	Y-204-3-B2MW W1A														

Project Information		Sample Receipt	
Project Number:	Y-204-3	Total Number of Containers	
Project Name:	Garrett's	COC Seals/Intact Y/N/NA	
Contact:	SUSAN GUHL	Received Good Cond./Cold	
Ongoing Project? Yes ☒ No ☐		Delivery Method:	
Sampler:	SUSAN GUHL / MATT HENRY	(attached shipping bill, if any)	

Instructions

Requested Turn Around Time:

Special Instructions:
NOTE TO S&W ONLY - B2MW-S1A is on mitral start-up. S1 was a test in January 2/8/94 SLGuhl
S1 was done for other reasons re: Tray Stripper.

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan L. Guhl Time: 12:11	Signature / Time	Signature / Time
Printed Name: SUSAN L. GUHL Date: 2/8/94	Printed Name / Date	Printed Name / Date
Company: Shannon & Wilson	Company	Company

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Jodi L. Maus Time: 12:11	Signature / Time	Signature / Time
Printed Name: JODI L. MAUS Date: 2/8/94	Printed Name / Date	Printed Name / Date
Company: CT+E	Company	Company

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

1134

Chain of Custody Record

Shannon & Wilson, Inc.

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Page 1 of _____
Laboratory CT&E
Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

94.0600

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	ETH GOZ BTEX	GRO	DRO					Total Number of Containers	Remarks/Matrix
(1) ~~Y-204-3-B1MW-S1~~ Y-204-3-B1MW/W1		11:20	2/8/94		✓	1	1	1						Water
* ~~Y-204-3-B2MW-S1A~~ Y-204-3-B2MW/W1A (2)		11:35	2/8/94		X	1	1	1						Water

Project Information	Sample Receipt
Project Number: Y-704-3	Total Number of Containers
Project Name: Garrett's	COC Seals/Intact Y/N/NA
Contact: SUSAN GUHL	Received Good Cond./Cold
Ongoing Project? Yes ☒ No ☐	Delivery Method:
Sampler: SUSAN GUHL / MATT / REMEY	(attached shipping bill, if any)

Instructions

Requested Turn Around Time:

Special Instructions:
NOTE TOS5W ONLY - B2MW-S1A is our Initial start up S1 was a test in January 2/8/94 S1 was done for other wells as Tray Stripper.

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan L Guhl Time: 12:11	Signature: Time:	Signature: Time:
Printed Name: SUSAN L. GUHL Date: 2/8/94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time: 12:11	Signature: Time:	Signature: Time:
Printed Name: Date: 2/8/94	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

F-19-91/UR-r9/92

-1135

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.1295-1
Client Sample ID	Y-204-3-B1MWW2
Matrix	WATER

Client Name	SHANNON & WILSON, INC.	WORK Order	76942	
Ordered By	SUSAN GUHL	Printed Date	04/05/94	@13:28 hrs.
Project Name	GARRETTS	Collected Date	03/25/94	@11:25 hrs.
Project#	Y-204-3	Received Date	03/25/94	@13:50 hrs.
PWSID	UA			

Technical Director: STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL, PATTERN IS MORE CONSISTENT WITH GASOLINE RANGE ORGANICS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Hydrocarbons EPH	12.7		mg/L	3510/3550/8100M		03/29/94	03/30/94	DRS
VPH & BTEX				5030/8015M/602				
Hydrocarbons VPH	67.1	D	mg/L	EPA 5030/8015m		03/28/94	03/28/94	WLS

Benzene	9.38	D	mg/L	EPA 602		03/28/94	03/28/94	WLS
Toluene	16.6	D	mg/L	EPA 602		03/28/94	03/28/94	WLS
Ethylbenzene	4.00	D	mg/L	EPA 602		03/28/94	03/28/94	WLS
p & m Xylene	11.7	D	mg/L	EPA 602		03/28/94	03/28/94	WLS
o-Xylene	3.27	D	mg/L	EPA 602		03/28/94	03/28/94	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.
SINCE 1908
Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.1295-2
Client Sample ID	Y-204-3-B2MWW2
Matrix	WATER

Client Name	SHANNON & WILSON, INC.	WORK Order	76942	
Ordered By	SUSAN GUHL	Printed Date	04/05/94	@ 13:28 hrs.
Project Name	GARRETTS	Collected Date	03/25/94	@ 12:55 hrs.
Project#	Y-204-3	Received Date	03/25/94	@ 13:50 hrs.
PWSID	UA			

Technical Director: STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL, PATTERN IS MORE CONSISTENT WITH GASOLINE RANGE ORGANICS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Hydrocarbons EPH	18.5		mg/L	3510/3550/8100M		03/29/94	03/30/94	DRS
VPH & BTEX				5030/8015M/602				
Hydrocarbons VPH	202	D	mg/L	EPA 5030/8015m		03/28/94	03/28/94	WLS

Benzene	63.3	D	mg/L	EPA 602		03/28/94	03/28/94	WLS
Toluene	45.6	D	mg/L	EPA 602		03/28/94	03/28/94	WLS
Ethylbenzene	3.47	D	mg/L	EPA 602		03/28/94	03/28/94	WLS
p & m Xylene	8.66	D	mg/L	EPA 602		03/28/94	03/28/94	WLS
o-Xylene	4.23	D	mg/L	EPA 602		03/28/94	03/28/94	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.1295-3
Client Sample ID	Y-204-3-B11MWW2
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-3
PWSID	UA

WORK Order	76942		
Printed Date	04/05/94	@ 13:28	hrs.
Collected Date	03/25/94	@ 12:00	hrs.
Received Date	03/25/94	@ 13:50	hrs.

Technical Director: STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL, PATTERN IS MORE CONSISTENT WITH GASOLINE RANGE ORGANICS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Hydrocarbons EPH	19.8		mg/L	3510/3550/8100M		03/29/94	03/30/94	DRS
VPH & BTEX				5030/8015M/602				
Hydrocarbons VPH	52.9	D	mg/L	EPA 5030/8015m		03/28/94	03/28/94	WLS

Benzene	6.95	D	mg/L	EPA 602		03/28/94	03/28/94	WLS
Toluene	12.4	D	mg/L	EPA 602		03/28/94	03/28/94	WLS
Ethylbenzene	3.16	D	mg/L	EPA 602		03/28/94	03/28/94	WLS
p & m Xylene	9.37	D	mg/L	EPA 602		03/28/94	03/28/94	WLS
o-Xylene	2.69	D	mg/L	EPA 602		03/28/94	03/28/94	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

94.1295

Shannon & Wilson, Inc.

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Chain of Custody Record

Page 1 of 1

Laboratory CT&E

Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

94.1295

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 5030/8015 GRO	EPA 3550/8100 DRO PAHs	EPA 602 BTEX					Total Number of Containers	Remarks/Matrix
1	Y-204-3-B1MWW2		11:25	3/25/94		1	1	1	1						Water
2	Y-204-3-B2MWW2		12:55	3/25/94		1	1	1	1						Water
3	Y-204-3-B11MWW2		12:00	3/25/94		1	1	1	1						Water

Project Information	Sample Receipt
Project Number: Y-204-3	Total Number of Containers
Project Name: Garrett's	COC Seals/Intact Y/N/NA
Contact: SUSAN GUHL	Received Good Cond./Cold
Ongoing Project? Yes ☒ No ☐	Delivery Method:
Sampler: SUSAN GUHL	(attached shipping bill, if any)

LINDA STANDARD

Instructions

Requested Turn Around Time: REGULAR

Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan L Guhl Time: 13:50	Signature Time	Signature Time
Printed Name: SUSAN L. GUHL Date: 3/25/94	Printed Name Date	Printed Name Date
Company: Shannon & Wilson	Company	Company
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Jody L Maus Time: 1350	Signature Time	Signature Time
Printed Name: JODY L. MAUS Date: 3/25/94	Printed Name Date	Printed Name Date
Company: CT&E	Company	Company

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19 91/UR-r9/92

1139

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

SEATTLE
HANFORD
FAIRBANKS
ANCHORAGE
BOSTON
SAINT LOUIS

1140

April 11, 1994

Garrett's Tesoro
724 West International Airport Road
Anchorage, Alaska 99518

Attn: Mr. Nelson Garrett

RE: MONITORING WELL INSTALLATION AT 724 WEST INTERNATIONAL AIRPORT ROAD, REPLACEMENT OF B3MW, ANCHORAGE, ALASKA SPILL #: 90-2-1-0-010-1, FILE #: L20.01

We are submiting our proposal and cost estimate for installing a replacement groundwater monitoring well in the southeastern portion of the site, at the location shown in Figure 1. The proposed replacement well is designated B3MW. The purpose of the well is to replace the original B3MW monitoring well which was removed during installation of three new underground storage tanks (USTs) as part of an ADEC funded tank upgrade grant. Two existing monitoring wells, designated B1MW and B2MW are presently available for sampling and monitoring activities at the third well will provide for continued monitoring for petroleum contaminants or hazardous substances in the groundwater at the site. It will also be used to assist in determining groundwater conditions, such as depth to groundwater and system effectiveness over the life of the on-going soil and groundwater remediation program.

SCOPE OF WORK

This work involves the installation of one groundwater monitoring well and documentation of the soil/well log,t he results of which to be presented in the next Quarterly Status Report for the soil/groundwater remediation project. The new monitoring well is to be a replacement for the former monitoring well B3MW. This third well will allow water level measurements to be taken which when combined with the two existing well data will determine the direction of the groundwater flow. The work will be performed in accordance with our ADEC approved Quality Assurance Project Plan. Based on our conversations with you, we believe that this scope is consistent with what is being requested and the local standard of practice.

Field Explorations

For this phase of the project, one monitoring well will be drilled and installed at the site. The exact location of the well will take into consideration the location of underground and overhead utilities.

Based on our explorations performed at the southern end of the site, the depth to groundwater should be about 17 to 25 feet below the surface. The well will be drilled to a depth of 30 feet, or five feet below groundwater. Monitoring well drilling and installation will be performed by Discovery Drilling of Anchorage, under subcontract to Shannon & Wilson. The driller will provide a truck mounted drill rig using 4-inch continuous hollow stem augers to advance the soil boring. Drill cuttings generated during the drilling will be contained in a separate soil sack and left on site in an area designated by the client. Disposal of the drill cuttings will be the responsibility of Mr. Nelson Garrett. Disposal alternatives include Alaska Soils Recycling and CleanSoils of Anchorage.

5430 FAIRBANKS STREET • SUITE 3
ANCHORAGE, ALASKA 99518
907 • 561 • 2120 FAX 907 • 561 • 4483

At the completion of the boring, a 2-inch monitoring well will be installed. The well will be constructed of 2-inch nominal I.D. Schedule 40 PVC pipe with threaded connections. The lower portion of the well will be made up of PVC well screen with 0.020 inch slots. The screen will extend from the bottom of the hole to 5 feet above the water table, for a total length of 10 feet. A continuous sand pack consisting of #8-#12 filter sand will be used to backfill around the well screen to about 2 feet above the screen and capped with a 6 to 12 inch secondary sand pack of #20-#40 filter sand. Volclay grout or bentonite chips will be used to backfill around the PVC in the vadose zone to about 2.0 feet below grade. A flush mounted steel protective casing embedded in a portland cement/pea gravel grout will be used around the monitoring well. The grout will extend to a depth of 2.0 feet.

Following the completion of our field work, a soil boring/groundwater well log with groundwater measurements will be prepared and submitted in the next Quarterly Status Report for the soil and groundwater remediation program when it is completed, a scaled site plan showing important site features with the boring and monitoring well locations, and a summary water sampling log will be included in the Quarterly status report. The results of the measurements will be used to plot the potentiometric surface contours for the site and indicate the direction of groundwater movement at the site.

SCHEDULE

Our current schedule is such that the monitoring well installation work can begin within a week after authorization to proceed. To ensure that the site assessment tasks outlined in the work plan are accomplished in an efficient and expedient manner the following tentative schedule has been established:

Activity	Date
Notice to Proceed	4/15/94
Utility Locates	4/17/94
Install One Monitoring Well	4/18/94
Water Level Measurement	4/19/94
Monitoring Well Survey	4/20/94
Status Report (tentative date)	2nd Quarter, 1994

COST ESTIMATE

We are prepared to undertake the work described above on a time and expense basis. We can typically respond within 24 hours of your authorization. Our estimated costs for the groundwater assessment and monitoring well sampling work are attached. As shown on the attached cost estimate, we have provided for an experienced geologist or engineer from Shannon & Wilson to be present full time during the field exploration work. The total estimated cost for the assessment work is $2,824, which we agree not to exceed without your prior authorization. We request that these funds be provided from existing Clean-up Grant 22 for this site.

We have not included in our estaimte the fees for disposal of any contaminated drill cuttings because of the potential variability in the costs. It is important that the disposal of any contaminated soil meets the regulatory requirements and is documented.

In order to better understand the subsurface investigation we have proposed, Shannon & Wilson has prepared the enclosed bulletin titled "Important Information About Your Geotechnical Engineering/Subsurface Waste Management (Remediation) Proposal".

We appreciate this opportunity to be of service. If you have any questions or comments, or wish to revise the scope of our services, please contact the undersigned. We look forward to the opportunity to work with you on this project and appreciate your confidence in our firm.

Sincerely,

SHANNON & WILSON, INC.

Prepared By:
Susan L. Guhl
Susan L. Guhl
Hydrogeologist

Approved By:
Fred R. Brown
Fred R. Brown, P.E.
Vice President

SLG/LMM/mac

Encl. Summary Cost Estimate
Agreement for Professional Services
Important Information About Your Geotechnical Engineering/Subsurface Waste Management (Remediation) Proposal

Acceptance

I accept the above conditions and authorize installation of a groundwater monitoring well on this property to proceed.

By:_____ Date:_____
Signature

Printed Name & Title:_____ _____

ADEC Review and Approval:

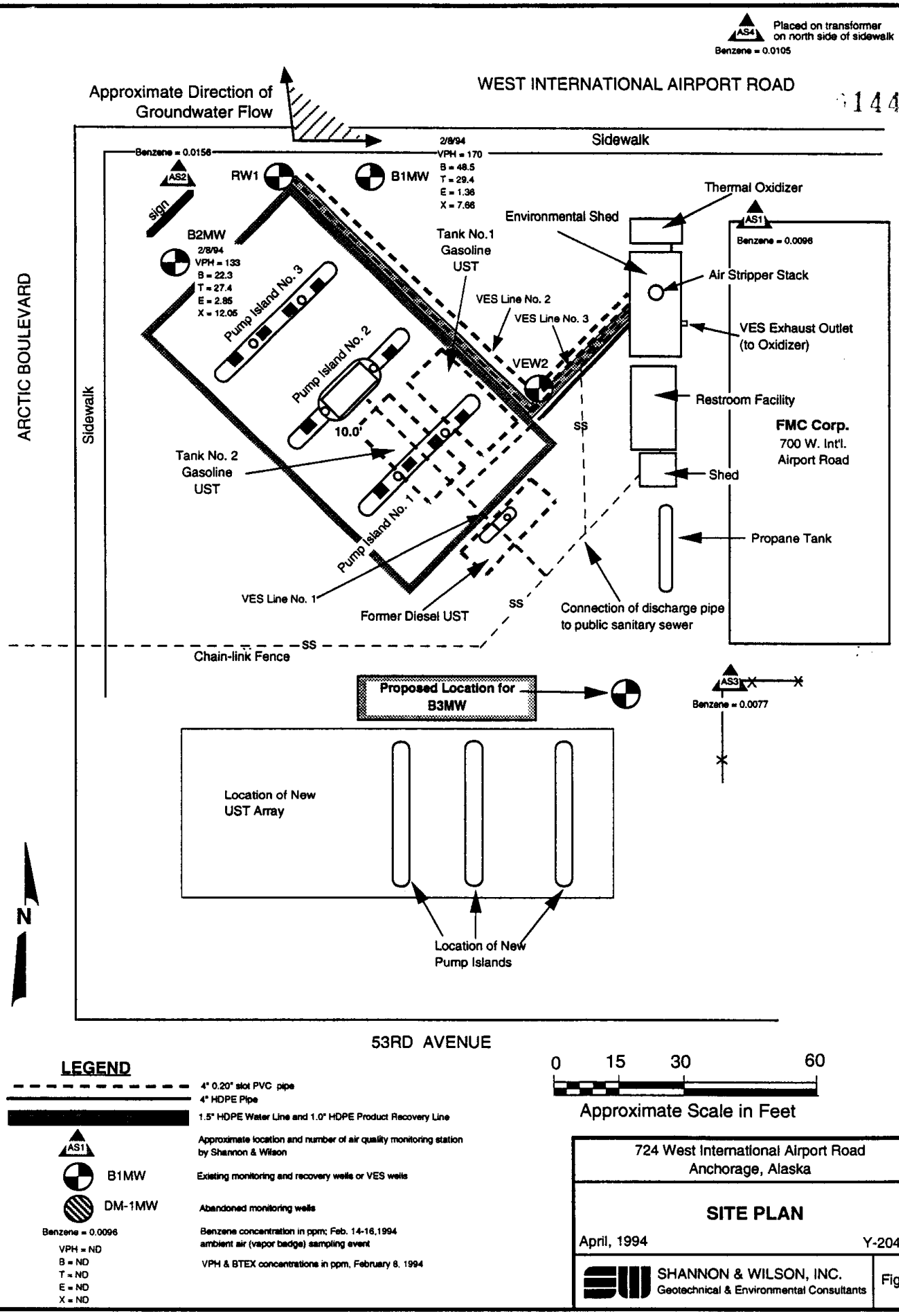
By: Robert Weimer Date: 4/13/94

Printed Name & Title: Robert Weimer Environmental Specialist ADO

SUMMARY COST ESTIMATE

MONITORING WELL INSTALLATION								COSTS
1. Conduct Drilling, Well Installation and Development for B3MW								
Field Exploration								
Shannon and Wilson								$840
Engineer/Geologist		14 hrs.	@	$60 /hr.	=	$840		
Monitoring Well Installation	4 hrs.							
Monitoring Well Development	3 hrs.							
Monitoring Well Surveying	2 hrs.							
S&W Equipment Rental & Reimburseables								$121
Item		Units		$Ea.				
Well Development Pump	(days)	1	@	15	=	$15		
Level, rod and tripod	(days)	1	@	15	=	$15		
3-ton bags - drill cuttings	(each)	1	@	45	=	$45		
(Sample bottles, distilled water, protective gear, mileage, etc.)					=	$30		
				Subtotal		$105		
S&W Mark-up (15%)					=	$16		
				Total		$121		
Discovery Drilling								$1,590
Mob/demob						$150		
Drilling, sampling, equipment decontamination								
Monitoring Well 2-inch (1 @ 30')		30 ft	@	$45 /ft	=	$1,350		
				Subtotal		$1,500		
S&W Mark-up (15%)					=	$90		
				Total		$1,590		
2. Laboratory Analyses (soil samples only)*								
Commercial Testing & Engineering								$273
Diesel Range Organics - Soil	EPA 8100M	1	@	113	=	$113		
Aromatic Volatle Organics - Soil (BTEX)	EPA 8020/8015	1	@	95	=	$95		
Total lead - Soil	EPA 7421	1	@	50	=	$50		
				Subtotal		$258		
S&W Mark-up (15%)					=	$15		
				Total		$273		
3. Status Report								$300
Engineer/Geologist		5 hrs.	@	$60 /hr.	=	$300		
				Install Replacement Monitoring Well B3MW - Total				**$2,824**

* NOTE - Groundwater samples will be collected and analyzed during quarterly sampling events.



724 West International Airport Road
Anchorage, Alaska

SITE PLAN

April, 1994 Y-204-3

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 1

SHANNON & WILSON, INC.
Geotechnical Consultants
5430 Fairbanks Street, Suite 3 • Anchorage, Alaska 99518 • Phone: (907) 561-2120 • FAX: (907) 561-6483

6145

LETTER OF TRANSMITTAL

Date 8/11/94/ADO No. Y-204-3

To: Robert Weimer
ADEC-WDO

Attention:

Re: 2nd Qtrly Report
Garrett's Tesoro

We are sending the following items: ☐ Attached ☐ Under separate cover via _____

☐ Report ☐ Proposal ☐ Drawings ☐ Sample ☐ Specifications

Copies	Date	No.	Description
1	8/11/94		April to Mid-July, 1994 Qtrly Report
			724 W. Int'l Airport Rd.
			Spill #90-2-1-0-010-1
			File L20.01

These are transmitted:

☒ For your retention ☐ For your use ☐ As requested

☐ For review and comment ☐ For action specified below ☐ With corrections

☐ Please return by _____ ☐ Prints returned after use by us ☐ _____

Remarks:

Please review and call with any questions.

Copies to _____ By Susan L. Gehl

☐ Invoice File ☐ Correspondence File

L20.01

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

SEATTLE
HANFORD
FAIRBANKS
ANCHORAGE
BOSTON
SAINT LOUIS

146

August 10, 1994

Alaska Department of Environmental Conservation
800 East Dimond Boulevard, Suite #3-470
Anchorage, Alaska 99515

Attn: Mr. Robert Weimer

RE: APRIL TO MID-JULY, 1994 REMEDIATION MONITORING AT GARRETT'S TESORO, 724 WEST INTERNATIONAL AIRPORT ROAD, ANCHORAGE, ALASKA, SPILL #: 90-2-1-0-010-1, FILE #: L20.01

This letter report summarizes the status of the groundwater pump and treat and vapor extraction system at Garrett's Tesoro, 724 West International Airport Road, Anchorage, Alaska, for the period of April through mid-July, 1994. Also included are the results of quarterly groundwater monitoring conducted at the subject site. A site plan illustrating the general features at the project location is presented in Figure 1.

VES Monitoring

The Vapor Extraction System (VES) located at this site consists of two subsurface horizontal vapor recovery lines and one vertical vapor extraction well. The locations of these lines are shown in Figure 1. An additional dual-purpose water recovery/vapor extraction well exists on-site but was not incorporated into the VES system based on poor vapor recovery during feasibility testing. This well, designated RW1, is the pumping well for the groundwater treatment system. The VES system began continuous operation on January 5, 1994.

Monitoring of the Vapor Extraction System (VES) included the collection of vapor analytical samples from the sampling port installed on the exhaust manifold. Vapor samples were collected every 24 hours for the first seven days of operation, weekly for the subsequent three weeks, and monthly for all subsequent samples. Presently, stack exhaust sample collection is being conducted on a monthly basis.

Prior to sampling, field measurements were conducted to ensure the vapor sample was representative of the stack exhaust. To accomplish this, a polyethylene bag was used to capture exhaust vapors from the sampling port. Approximately every 5 minutes, temperature and flame ionization detector (FID) readings of the stack emissions were recorded. In addition, the velocity of air movement in the stack exhaust and the individual VES lines was measured in inches of water using an anemometer and/or pitot tubes. Once these parameters stabilized, analytical samples were collected in 1 liter stainless steel cylinders provided by the laboratory.

The monthly samples, designated VES12, VES13 and VES14, were collected on April 14, May 16, and June 14, 1994, respectively. The vacuum levels of Lines 1, 2 and 3 were adjusted prior to the April sampling event, with the objective of increasing the vacuum pressure. Increased concentrations of volatile organics, as shown in the analytical results, were also measured following the increased vacuum pressure adjustments. A log of system performance, including dates of sample collection, is provided in Table 1, a description of each sample collected is provided in Table 2, and a summary of vapor emission concentrations over time is presented on Graph 1.

5430 FAIRBANKS STREET • SUITE 3
ANCHORAGE, ALASKA 99518
907 • 561 • 2120 FAX 907 • 561 • 4483

Groundwater Pump and Treat System Monitoring

The groundwater pump and treat system at this site consists of two unit operations: an oil/water separator with a batch holding tank to remove free product followed in series by a shallow-tray air stripper to reduce the dissolved phase of the hydrocarbons. Groundwater is recovered from a recovery well, RW1, using an on-line pump and passed through a sediment filter and flow meter prior to entering the oil/water separator.

During this quarter, water samples were collected twice monthly from both the influent and effluent sampling ports of the water treatment system. The results of these samples were used to monitor the system's aromatic volatile organics (BTEX) and total petroleum hydrocarbons (TPH) removal efficiency, and check for compliance with the AWWU discharge permit. Temperature, specific conductance, and pH (T-C-pH) values of the water samples were measured in the field at the time of sampling. A description of each water sample collected and the results of the T-C-pH measurements is provided in Table 3, and analytical testing results are presented in Appendix B on Table B-1. Time trends shown in Graph 2 represent the concentrations of benzene, BTEX, and VPH in influent water from Well RW1.

During the period from April to mid-July, the groundwater treatment system had to be shut down on several occasions when sample tests showed that the effluent was not in compliance with the AWWU Permit #32 discharge limits of 0.1 ppm total BTEX and 10 ppm TPH. The total BTEX measured for several samples exceeded the allowable level of 0.1 ppm. Problems with the treatment system were attributed to several different causes, as discussed below.

The system was shut down following receipt of analytical results for effluent Samples Y-204-3-Effl-S9, and -S10 which indicated non-compliance with the AWWU permit. These two samples were collected on April 14 and May 16, 1994, respectively, and contained total BTEX concentrations of 9.26 ppm and 0.818 ppm. The system was then repaired by B.C. Excavating (B.C.) and a test of the system was conducted on May 27, 1994. They reported that layers of iron bacteria had built up on the shallow trays. B.C. steam cleaned the shallow stripper trays and re-assembled the stripper chamber. After system re-start, samples collected on May 27 showed Effluent Sample RW1-Effl-S11 contained no detectable levels of TPH and 1.16 ppm total BTEX, which exceeded the discharge permit requirements of 0.1 ppm total BTEX. The system was again shut down on May 30, 1994 and inspected by B.C.

Another sample was collected on June 7, 1994 soon after the system was repaired and inspected again. Effluent sample RW1-Effl-S12 contained 0.0013 ppm total BTEX, which met the discharge permit requirements.

On about June 12, 1994, B.C. once again inspected the shallow tray stripper and found that the seals were not tight, and re-sealed the trays. Upon another re-start on June 14, 1994, Sample Y-204-3-Infl-S13 and Effl-S13 were collected. The BTEX test results were requested on a 24-hour rush turn-around basis and showed the total BTEX level of 0.1466 ppm did not meet discharge requirements. Subsequently, the water system was shut off on approximately June 16, 1994.

The water treatment system remained out of operation until mid-July, 1994. B.C. implemented changes to the internal float system in the stripper by adjusting the water level at which the blower for the stripper automatically turned on. After this adjustment, the system was re-started for a temporary test on July 19, 1994. Influent and effluent water samples were collected, and designated RW1-Infl-S14 and RW1-Effl-S14. The samples were analyzed on a 24-

hour rush turnaround for BTEX, and regular turnaround for TPH. The rush BTEX results showed that the effluent was being treated properly. The total BTEX measured at 0.0078 ppm. The TPH test results were non-detectable. The system was returned to service on July 22, 1994. A weekly sample of the influent and effluent was collected on August 5, 1994, samples designated Y-204-3-Infl-S15 and Y-204-3-Effl-S15, to confirm that the system is operating properly. Results for samples -S15 are pending. Results for samples -S8 through -S14 are presented in Appendix B.

Ambient Air Quality Monitoring

Ambient benzene standards of 0.1 ppm and 1.0 ppm for a time-weighted (TWA) 8-hour exposure have been established by NIOSH (National Institute for Occupational Safety & Health) and OSHA /ACGIH (Occupational Safety & Health Administration and the American Conference of Government Industrial Hygienists), respectively. Since this site is located in a residential area, the more stringent 0.1 ppm level for NIOSH will be adhered to.

The treatment systems located at this site produce two distinct sources of benzene emissions: the VES exhaust stack and the groundwater treatment exhaust stack. During the period from April to mid-July, benzene levels in the three VES stack exhaust samples ranged from 12.8 ppm to 41.8 ppm. Although these levels exceed the NIOSH and OSHA standards, a thermal oxidizer is presently being used to burn off all recovered hydrocarbons in the stack exhaust. Reduced amounts of volatile organic vapors in the VES exhaust stack, and continually decreasing lower explosive levels (LEL) in the exhaust stack, indicate that the thermal oxidizer can soon be removed from the system. The VES vapors can then be vented to the atmosphere without resulting in ambient benzene concentrations in excess of the acceptable 0.1 ppm NIOSH standard.

In contrast, the volatiles removed by the air stripper are currently being vented to the atmosphere. Based on the recovery rates established by influent and effluent testing, the listed blower capacity, and an estimated water loading rate of 5 gallons per minute, benzene emissions during the April to mid-July, 1994 period ranged from zero during periods when the treatment system was off-line to a maximum of about 2.7 ppm in April, 1994.

To ensure that resulting ambient benzene levels are below the NIOSH standard, a monitoring program has been established that consists of both direct measurements and computer modelling of on-site ambient benzene concentrations. The computer model, "Screen2" was run for the 2nd quarter data using exhaust stack VPH and benzene analytical results. The computer-derived value for the highest concentration of benzene was calculated to be 0.0086 ppm, with the most probable location for this concentration to be found at about 89 feet from the exhaust stack. Based on "Screen2" calculations, it is assumed that the NIOSH TWA benzene standard of 0.1 ppm will not be exceeded provided benzene emissions from the air stripper and the VES stack exhaust remain below 470 ppm. As long as the oxidizer remains in use, the contributions from the VES system to the ambient air are assumed to be zero. However, it is the intent to remove the thermal oxidizer when it can be removed from the system and still not pose a human health risk to ambient air quality.

Likewise, based upon model calculations, emissions from the air stripper exhaust will not exceed 470 ppm so long as benzene concentrations in the groundwater treatment system's influent remain below 2200 ppm. During the period between April and June, influent concentrations ranged from 8.52 to 12.6 ppm.

Additional Ambient Air Testing

An ambient air testing program was implemented starting in June 1994. The purpose of this test was to verify that the combined emissions from the shallow tray stripper and VES exhaust stack do not cause ambient air concentrations to exceed the NIOSH standard. This was scheduled to be done in two sampling sessions. The first sampling session was designed to measure background level emissions. The second session was designed to measure emissions of the shallow tray stripper and VES exhaust stack. Due to problems with the water system and its subsequent shutdown during the second monitoring period, only VES emissions were measured during the second monitoring period. A third test is being implemented during the month of August to again try monitoring the combined emissions of the shallow tray stripper and VES exhaust stack. The full test results will be reported in the 3rd Quarterly Report.

The tests that have been conducted so far have taken place over two separate four (4) day periods. A single 3M Model 3520 Organic Vapor Monitor Badge was placed at each of four sampling stations for direct measurement of ambient benzene concentrations. For the first monitoring session, the VES exhaust stack was on, the shallow tray stripper was off, and the thermal oxidizer was on. Because the thermal oxidizer was burning the emissions, background level air quality was measured. The badges were placed at a height within the potential breathing zone (4 to 5 feet high) and exposed for 4 days, from June 24 through June 28, 1994, and then collected for laboratory analysis. Vapor Badge Samples AS1-2, AS2-2, AS3-2 and AS4-2 were collected on June 28, 1994 for a total exposure time of approximately 5700 minutes.

The second ambient air test was conducted from July 19 through July 23, 1994. During this sampling session, the VES system was on, the water treatment system and shallow tray stripper was off, and the thermal oxidizer was temporarily shut off. At this time all VES emissions were vented directly to the ambient air. An Organic Vapor Monitor Badge was again placed at each of the identical four sampling stations as the previous test. The samples were designated AS1-3, AS2-3, AS3-3 and AS4-3. The badges were exposed for approximately 5800 minutes, and then collected for laboratory analysis. The thermal oxidizer was re-connected to the VES exhaust stack by B.C. on August 2, 1994. Sampling locations are shown in Figure 1. A description of each vapor sample collected is in Table 2, and laboratory results are summarized in Table 4.

A third ambient air test is scheduled for August, 1994. The test will measure combined VES and water treatment emissions at the site.

Groundwater Monitoring

Influent samples collected from the groundwater treatment system are used not only to determine the efficiency of the treatment system, but also to provide a gauge of the hydrocarbon concentrations remaining in the site's groundwater and the effectiveness of the remediation efforts. The influent sample testing is augmented by a quarterly monitoring program of three groundwater monitoring wells, designated B1MW, B2MW, and B3MW.

With the exception of Monitoring Well B2MW, all previously installed monitoring wells at this site were made inaccessible or destroyed during the installation of three new USTs and associated site restoration activities which occurred in 1992 and 1993. In order to provide a minimum of three groundwater monitoring locations for sampling and determining the groundwater potentiometric surface, Monitoring Wells B1MW and B3MW were reinstalled.

Monitoring Well B1MW was installed on February 6, 1994 in close vicinity to its previous location on the north side of the project site.

Replacement Monitoring Well B3MW was installed on May 20, 1994, at approximately 30 feet to the southwest of the former B3MW location. The elevations of all three wells were surveyed on June 7, 1994, using a temporary bench mark established at the site. The locations of the wells, along with corresponding BTEX and VPH concentrations, are shown on Figure 1. A Log of Boring B3MW, along with monitoring well details, is presented in Figure 2 and discussed in the next section of this report labelled Soil Sampling.

One groundwater sample was collected from each of Monitoring Wells B1MW, B2MW, and B3MW, on June 30, 1994. Temperature, specific conductance, pH, and dissolved oxygen values of each water sample were measured in the field at the time of sampling. Purging, sampling and water level data as well as other measurements from the June sampling event are presented in Table 2. Historical summaries of VPH, benzene and total BTEX concentrations versus time are presented for Recovery Well RW1 and Monitoring Wells B1MW, B2MW and B3MW in Graphs 2 through 5, respectively.

Soil Sampling

During the drilling of Boring B3MW, soil samples were collected and field screened using an HNU photoionization device (PID). The soils encountered in Boring B3MW are a moist, brown, gravelly sand for the first 5-feet. From 5.0 to 27.0-feet, the soil was a moist to wet, sandy silt to silty sand.

Based on the results of the field screening, one soil sample was submitted for analytical testing. This sample, B3MWS4, was collected near the top of the water table at a depth of about 21 feet, and had a measured headspace reading of 100 ppm. The results of the headspace screening and field classification for the soil samples are presented graphically on the Log of Boring, Figure 2. A summary of the analytical test results is presented in Table 4.

Laboratory Analyses

During this quarterly sampling period, a total of twenty-nine (29) vapor, water, air badge, groundwater and soil samples were submitted to Commercial Testing & Engineering, Co. (CT&E) of Anchorage, for laboratory analysis. All samples were delivered to the lab in chilled coolers using Chain-of-Custody procedures.

Analytical results are presented on Graphs 1 through 5 and the individual laboratory reports are presented in Appendix A. A table summarizing all influent and effluent analytical results is included in Appendix B, Table B-1.

During this quarterly sampling period, three (3) vapor samples from the VES discharge stack were collected using stainless steel vapor canisters. All samples were analyzed for aromatic volatile organics (BTEX) using EPA Method 8020 and volatile petroleum hydrocarbons (VPH) using EPA Method 5030/8015. The test for VPH is also referred to as gasoline range organics (GRO) when testing soil and groundwater. The analytical results for all vapor canister analyses are listed on Graph 1.

During this quarterly sampling period, a total of fourteen (14) influent and effluent water samples from the groundwater treatment system were submitted for analysis. All fourteen samples were tested for BTEX using EPA Method 602 and total petroleum hydrocarbons (TPH) using EPA Method 418.1. Results for influent treatment sampling are listed in Graph 2.

During June and July, eight (8) ambient air vapor badges were submitted and analyzed for BTEX using EPA Method 8020 and VPH using EPA Method 5030/8015. The results of the analyses for the two test periods presented in Table 4.

The three (3) groundwater samples collected from Monitoring Wells B1MW, B2MW and B3MW were also submitted for analysis. All samples was tested for BTEX using EPA Method 602 and GRO using EPA Method 5030/8015. The results for all groundwater analyses are presented on Graphs 3, 4 and 5.

Soil sample B3MWS4 was submitted for analysis. The sample was tested for BTEX using EPA Method 8020, total lead using EPA Method 7421GF, GRO using EPA Method 5030/8015 and diesel range organics (DRO) using EPA Method 3550/8100M. The results for these analyses are listed in Table 4.

Discussion of Results

Soil Vapor - As shown in Graph 1, the overall trend for VPH concentration in the stack exhaust samples showed a decrease from the previous quarter, with the exception of April operations that took place after vacuum pressures were increased. The VPH concentrations in the individual vapor samples ranged from a maximum concentration of 1120 ppm, or 63 lb/day, in Sample VES12 to 124 ppm, or 8 lb/day, in Sample VES13. The trend in the stack samples' benzene concentrations generally mirrored that exhibited by the VPH concentration, with concentrations ranging from 41.8 to 12.8 ppm for Samples VES12 and VES13, respectively.

The increase in both VPH and benzene levels measured in April, 1994 is related to the increased pressure induced in the system's three (3) VES lines. Vacuum pressures were increased just prior to the April sampling event, with the objective of increasing the rate of hydrocarbon vapor recovery.

Using the Ideal Gas Law, VPH analytical results, and the calculated daily rate of air flow from the VES, the average daily rate of volatile petroleum hydrocarbon discharge for the sampling period from April 1 to July 15, 1994 was computed to be about 25 pounds per day. Approximately 2,630 pounds of volatile petroleum hydrocarbons were vented from the site's subsurface soil during the second quarter of VES operation. Due to the high rate of VPH recovery in April, the total pounds and pounds per day average calculated for the April to mid-July period remain similar to corresponding results for the first quarter of operation. Levels measured in May and June were significantly lower than the April measurements.

Treated Groundwater - For the water samples taken during the second quarter, concentrations of total BTEX in the treatment system's influent samples, taken from Recovery Well RW1, ranged from 18.9 ppm in Sample Y-204-3-Infl-S12 to 29.7 ppm in Sample Y-204-3-Infl-S9, with an average value of about 23.5 ppm total BTEX. Similarly, TPH levels in the influent samples ranged from 3.56 ppm in Sample Y-204-3-Infl-S13 to 8.15 ppm in Sample Y-204-3-Infl-S9, with an average value of about 6.4 ppm TPH which are below the permit discharge limit of 10 ppm. As shown on Graphs 1 and 2, the TPH and total BTEX concentrations in the influent samples indicate that groundwater treatment is necessary to reduce hydrocarbon concentrations in the groundwater

to below the concentrations allowed by our permit requirements. Although the TPH concentrations for influent samples have fluctuated, it appears that concentrations of benzene and total BTEX in the recovered groundwater have decreased slightly during this quarter. Note that the water treatment system operated intermittently during this quarter, due to system repairs.

During this quarter, four out of seven effluent samples tested did not satisfy the permit requirements for 0.1 ppm of total BTEX. The total BTEX levels of 9.26 ppm, 0.818 ppm, 1.167 ppm, and 0.146 ppm contained in effluent Samples Y-204-3-Effl-S9, Y-204-3-Effl-S10, Y-204-3-Effl-S11, and Y-204-3-Effl-S13, respectively, exceeded the allowable permit level. The total BTEX levels of 0.0102 ppm, 0.0013 ppm and 0.0078 ppm contained in effluent Samples Y-204-3-Effl-S8, Y-204-3-Effl-S12, and RW1-Effl-S14, respectively, were within permit limits.

Levels of TPH in all the effluent samples were below the permit discharge limit of 10 ppm, and ranged from non-detectable levels (<0.20 ppm) for Samples Effl-S11, -S12, -S13 and -S14, to a level of 1.25 ppm for -Effl-S9.

Based upon the influent and effluent sample results, the groundwater treatment system's total BTEX removal efficiency was 99.96%, 68.98%, 96.59%, 94.39%, 99.99%, and 99.36% for the six sampling events during the April to mid-July, 1994 period. As part of Permit No. 32 requirements, Mr. Ed Tatro and Mr. Peter Jeskie of AWWU were notified of the above results in required monthly reports, dated April 13, 1994, May 20, 1994, June 16, 1994 and July 19, 1994.

As discussed previously, the groundwater pump and treatment system was not in operation during several weeks of this quarter due to various problems which resulted in discharging treated water with BTEX levels above the permissible limits. The system was put into operation again on July 22, 1994. A sample was collected on August 5, 1994, to confirm that the system is operating properly.

Ambient Air - Two ambient air tests were conducted during this quarter. The first test measured ambient air background levels of VPH and BTEX. Vapor Badges Y-204-3-AS1-2 through -AS4-2 were placed at ambient air Stations No. 1 through No. 4, respectively, from June 24 through 28, 1994. Vapor Badge AS1-2 contained 0.0084 ppm VPH and 0.0018 ppm benzene. Vapor Badge AS2-2 contained 0.0147 ppm VPH and 0.0038 ppm benzene. Vapor Badge AS3-2 contained 0.0068 ppm VPH and non-detectable benzene. Vapor Badge AS4-2 contained 0.0100 ppm VPH and 0.0022 ppm benzene.

A second ambient air quality test was conducted on July 19, 1994 through July 23, 1994. This test measured VPH and BTEX for VES emissions. The four samples were designated Y-204-3-AS1-3 through -AS4-3. Vapor Badge AS1-3 contained 0.0985 ppm VPH and 0.0064 ppm benzene. Vapor Badge AS2-3 contained 0.0295 ppm VPH and 0.0058 ppm benzene. Vapor Badge AS3-3 contained 0.0394 ppm VPH and 0.0037 ppm benzene. Vapor Badge AS4-3 contained 0.0257 ppm VPH and 0.0026 ppm benzene.

The ambient benzene concentrations measured with the vapor badges are below the 0.1 ppm NIOSH standard for benzene established for this site. However, samples AS1-2, AS2-2, and AS4-2 are above the non-detectable benzene emissions expected from the stack exhaust when operating in conjunction with the thermal oxidizer. A likely cause for this condition is the presence of relatively large background levels of hydrocarbons contributed by customer retail petroleum fuel sales activity conducted at the on-site service facility and emissions from nearby traffic flow on Arctic Blvd. and International Airport Road. In addition, the second quarter vapor badge results for the June 24, 1994 and July, 1994 ambient air sampling sessions are less than the maximum

ambient benzene concentration predicted by the modelling program for worst-case meteorological conditions and zero percent oxidizer efficiency. The computer model, "Screen2" was run for these 2nd quarter data. Specifically, the computer-derived value for the data of 0.0086 ppm benzene located 89 feet from the exhaust stack is roughly two times the maximum benzene concentration measured with Vapor Badges Y-204-3-AS1-2 through -AS4-2, and slightly higher in value than the results for AS1-3 through AS4-3.

The intent of a planned third air monitoring test will be to show that the VES and shallow tray emissions can be vented to the air without exceeding the 0.1 ppm benzene NIOSH standard. This test is scheduled to be conducted in August, 1994. Based upon results of safe ambient air concentrations from this test, we will seek ADEC approval to safely remove the thermal oxidizer from the system. Final results will be presented in the next quarterly report.

Groundwater - Samples B1MWW3, B2MWW3, and B3MWW3 were collected from Monitoring Wells B1MW, B2MW, and B3MW, respectively, on June 30, 1994 as part of the second quarterly sampling event. Sample B1MWW3 contained 185 ppm GRO and 122.25 ppm total BTEX with 33.40 ppm benzene, 47.50 ppm toluene, 8.15 ppm ethylbenzene, and 33.20 ppm xylenes. Sample B2MWW3 contained 116 ppm GRO and 68.75 ppm total BTEX with 25.00 ppm benzene, 26.90 ppm toluene, 3.40 ppm ethylbenzene, and 13.45 ppm xylenes. Sample B3MWW3 contained 2.78 ppm GRO and 0.0910 ppm total BTEX with 0.0490 ppm benzene, 0.0330 ppm toluene, 0.0062 ppm ethylbenzene, and 0.0028 ppm xylenes. As shown in Graph 3, GRO, benzene, and total BTEX concentrations in Monitoring Well B1MW increased from the March sampling event. In contrast, it is evident in Graph 4 that all three parameters decreased in Monitoring Well B2MW since the previous event. These levels may indicate that gasoline impacted groundwater is moving toward the recovery well, RW1. Monitoring Well B3MW has had only one sampling event since its reinstallment on May 20, 1994.

Soil - Sample B3MWS4 was collected from the drill cuttings resulting from the installation of the new Monitoring Well B3MW. This sample, collected from a depth of about 20 feet and just above the water table, contained 18.5 ppm GRO, 24.0 ppm DRO, and 0.299 total BTEX with non-detectable levels of benzene, 0.064 ppm toluene, non-detectable levels of ethylbenzene, and 0.235 ppm xylenes. The analytical results for the drill cuttings from the replacement Monitoring Well B3MW classifies these soils as being below Level A soil cleanup criteria. Based on this classification, the owner was advised on July 6, 1994 that the soils could be landspread on-site, following acceptable ADEC guidelines. The soil was spread July 13, 1994, on the east side of the property as directed by the owner.

On-Going System Monitoring

Presently, the VES and groundwater treatment system is functioning properly. Recent influent and effluent testing indicated that elevated hydrocarbon levels in the site's groundwater are removed by the air stripper with an efficiency of about 99%. The repairs to the groundwater treatment system made by BC have brought the effluent from the shallow tray stripper into compliance.

Similarly, VES removal rates are gradually decreasing from a peak of 1980 ppm VPH on January 5, 1994, which corresponds to 187 pounds per day, to present levels of 283 ppm VPH with a calculated recovery volume of about 19 pounds per day. The increase in vacuum pressure exerted on the three VES lines in April markedly increased the volume of volatiles extracted from the subsurface soils. May and June monitoring results shows that volatile levels are again

decreasing over time. A total of approximately 8,640 pounds of VPH have been removed from the subsurface soils since January, 1994 using the VES system.

Upon conducting one more ambient air test, we will verify that combined emissions of both the VES and pump and treat systems will not elevate VPH concentration in ambient air above acceptable NIOSH standards. At that time, we will request ADEC approval to remove the thermal oxidizer from the VES system.

According to the requirements of the ADEC approved 1994 Workplan, Shannon & Wilson will continue to monitor the operations and effectiveness of the remediation system. We will present interim reports to ADEC following the predetermined schedule in the Workplan.

We appreciate this opportunity to be of service and your continued confidence in our firm. If you have any questions or comments concerning this submittal, please call the undersigned.

Sincerely,

SHANNON & WILSON, INC.

Prepared by:

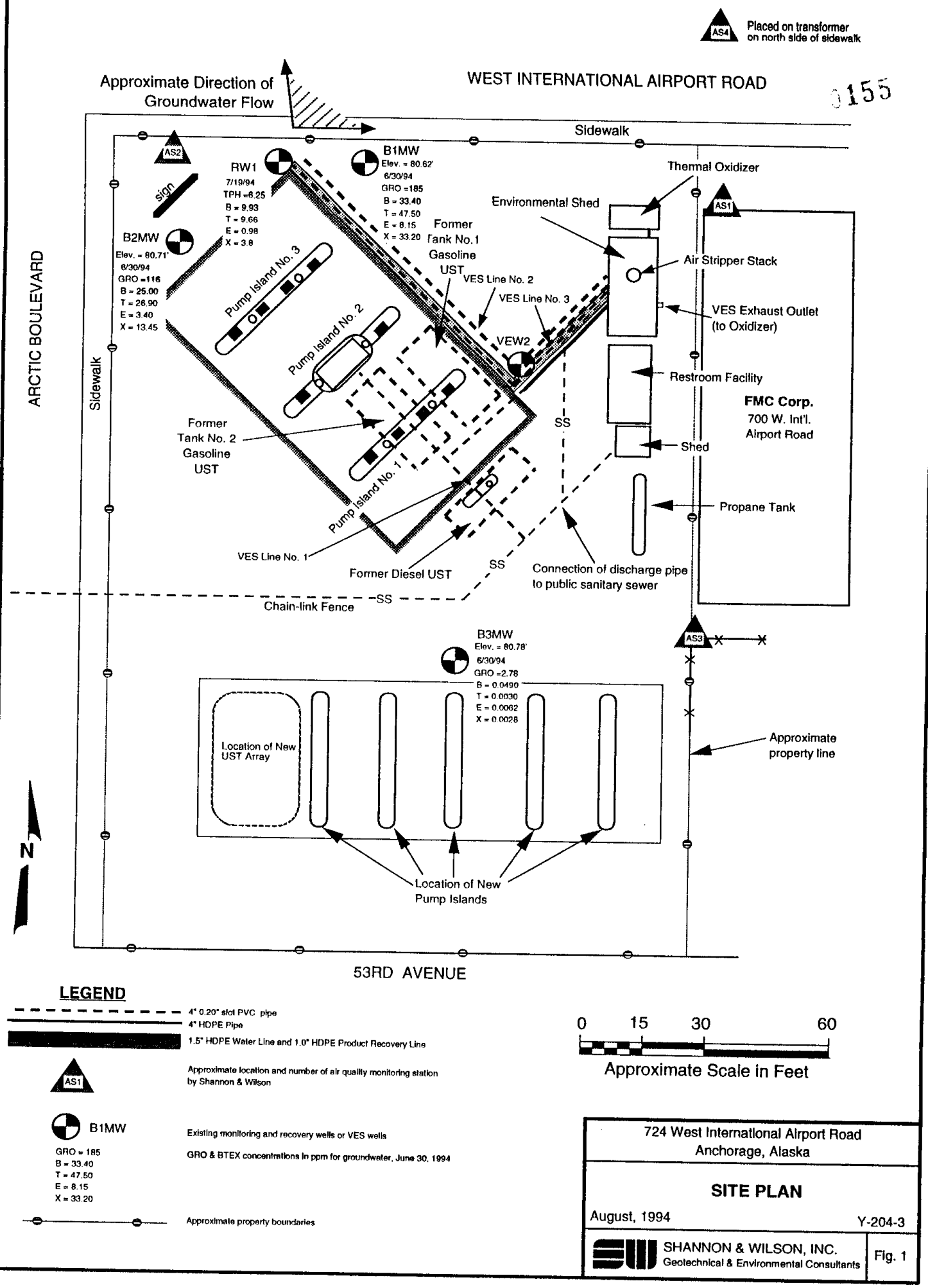
Susan L. Guhl, C.P.G.
Hydrogeologist

Approved by:

Fred R. Brown, P.E.
Vice President

Enc: Tables 1-4, Figures 1-2, Graphs 1-5,
Appendix A - Results of Analytical Testing by Commercial Testing & Engineering
Appendix B - Table of Influent and Effluent Analytical Results

cc: Mr. Nelson Garrett, Garrett's Tesoro
Mr. Randy Mileur, ADEC UST Financial Assistance Program



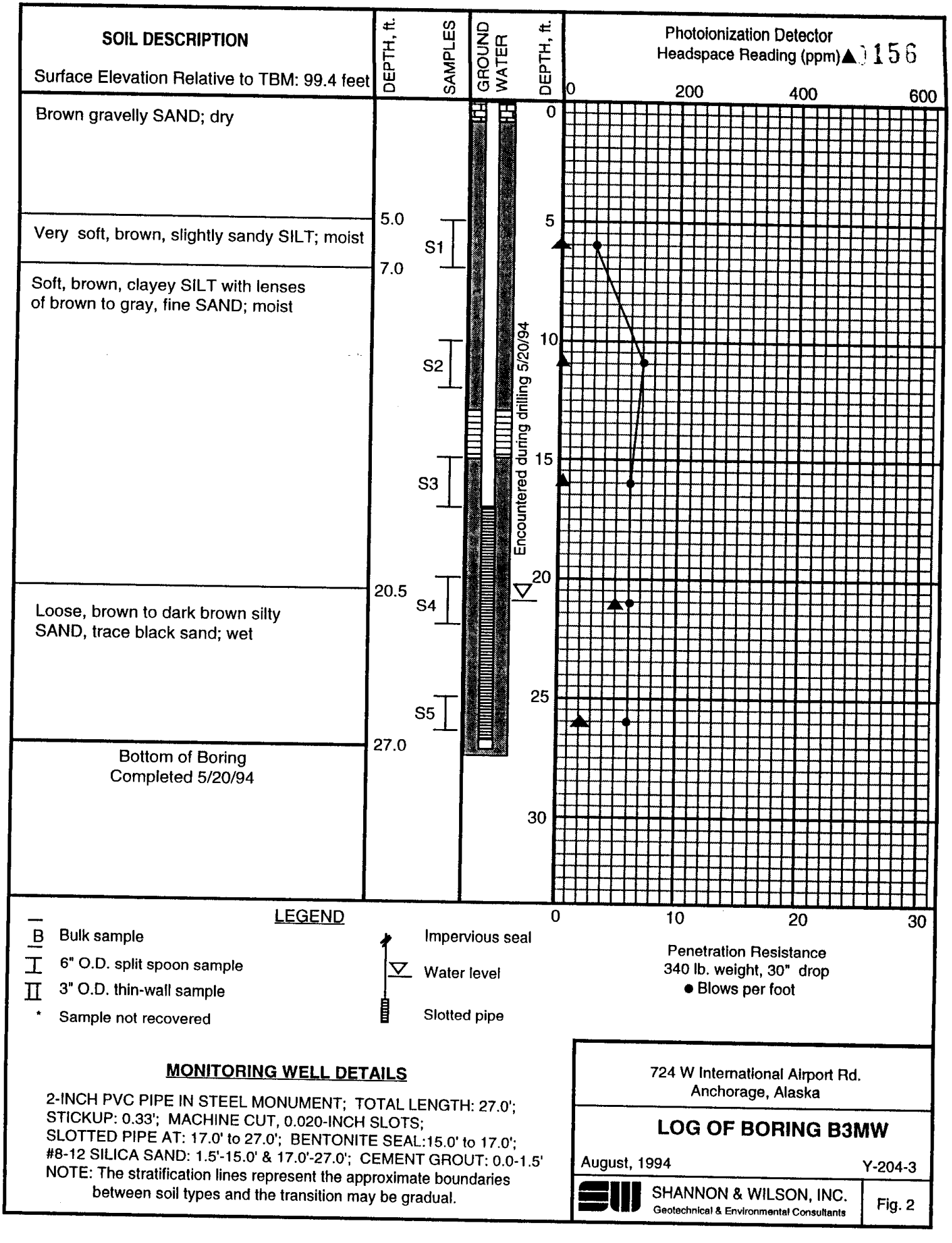
724 West International Airport Road
Anchorage, Alaska

SITE PLAN

August, 1994 Y-204-3

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 1



MONITORING WELL DETAILS

2-INCH PVC PIPE IN STEEL MONUMENT; TOTAL LENGTH: 27.0';
STICKUP: 0.33'; MACHINE CUT, 0.020-INCH SLOTS;
SLOTTED PIPE AT: 17.0' to 27.0'; BENTONITE SEAL:15.0' to 17.0';
#8-12 SILICA SAND: 1.5'-15.0' & 17.0'-27.0'; CEMENT GROUT: 0.0-1.5'
NOTE: The stratification lines represent the approximate boundaries between soil types and the transition may be gradual.

724 W International Airport Rd.
Anchorage, Alaska

LOG OF BORING B3MW

August, 1994 Y-204-3

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 2

TABLE 1 - VAPOR EXTRACTION SYSTEM (VES) MEASUREMENTS

Date	Time	Measurement Location/Note	FID ppm	VPH ppm	Temp F	Velocity† fpm	Air Flow scfm	Manometer (in. H20)	Knockout vacuum (in. H20)	Toxi-Guard A	Toxi-Guard B	Toxi-Guard C	Toxi-Guard D	Vapor Discharge lbs/day
4/1/94														
	14:42	Exhaust Stack	NM		131	1,990	174	0.19	49	32				
	14:45	Line 1						0.09						
	14:46	Line 2						0.035						
	14:47	Line 3						0.02						
4/14/94														
	14:35	Exhaust Stack	550	1120	132	1,750	153	0.17	53	37		1		63
	14:36	Line 1						0.155						
	14:37	Line 2						0.01						
	14:38	Line 3						0.015						
	14:40	Analytical Sample Y-204-3-VES12 Collected												
5/16/94														
	15:05	Exhaust Stack	3,000	124	118	1,950	170	0.22	36	29		2	1	8
	15:06	Line1						0.21						
	15:07	Line2						0						
	15:08	Line3						0.005						
	15:10	Analytical Sample Y-204-3-VES13 Collected												
5/27/94														
	11:05	Exhaust Stack	NM		112	1,930	168	0.21	36	26		2	1	
	11:06	Line 1						0.245						
	11:07	Line 2						0						
	11:08	Line 3						0						
6/14/94														
	10:10	Line1						0.023						
	10:11	Line2						0						
	10:12	Line3						0.005						
	10:13	Exhaust Stack	1,100	283	129	2,080	182	0.24	42	25		2	3	19
	10:22	Analytical Sample Y-204-3-VES14 Collected												

TABLE 2 - SAMPLE LOCATIONS AND DESCRIPTIONS

VAPOR SAMPLES

Sample Number	Date	Sample Location (See Figure 1)	Sample Classification
Y-204-3-VES12	4/14/94	Emission Stack sample	Air vapor sample
Y-204-3-VES13	5/16/94	Emission Stack sample	Air vapor sample
Y-204-3-VES14	6/14/94	Emission Stack sample	Air vapor sample

AMBIENT AIR SAMPLES

Sample Number	Date	Sample Location (See Figure 1)	Sample Classification
Y-204-3-AS1	2/14-16/94	Vapor Badge - Station #1, Sample No. 1	Ambient air sample
Y-204-3-AS2	2/14-16/94	Vapor Badge - Station #2, Sample No. 1	Ambient air sample
Y-204-3-AS3	2/14-16/94	Vapor Badge - Station #3, Sample No. 1	Ambient air sample
Y-204-3-AS4	2/14-16/94	Vapor Badge - Station #4,, Sample No. 1	Ambient air sample
Y-204-3-AS1-2	6/24-28/94	Vapor Badge - Station #1, Sample No. 2	Ambient air sample
Y-204-3-AS2-2	6/24-28/94	Vapor Badge - Station #2, Sample No. 2	Ambient air sample
Y-204-3-AS3-2	6/24-28/94	Vapor Badge - Station #3, Sample No. 2	Ambient air sample
Y-204-3-AS4-2	6/24-28/94	Vapor Badge - Station #4, Sample No. 2	Ambient air sample
Y-204-3-AS1-3	7/19-23/94	Vapor Badge - Station #1, Sample No. 3	Ambient air sample
Y-204-3-AS2-3	7/19-23/94	Vapor Badge - Station #2, Sample No. 3	Ambient air sample
Y-204-3-AS3-3	7/19-23/94	Vapor Badge - Station #3, Sample No. 3	Ambient air sample
Y-204-3-AS4-3	7/19-23/94	Vapor Badge - Station #4, Sample No. 3	Ambient air sample

TREATMENT SYSTEM WATER SAMPLES

Sample Number	Date	Sample Location (See Figure 1)	Sample Classification
Y-204-3-RW1-Infl-S8	4/1/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-RW1-Effl-S8	4/1/94	Groundwater Treatment System Effluent	Water Sample
Y-204-3-RW1-Infl-S9	4/14/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-RW1-Effl-S9	4/14/94	Groundwater Treatment System Effluent	Water Sample
Y-204-3-RW1-Infl-S10	5/16/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-RW1-Effl-S10	5/16/94	Groundwater Treatment System Effluent	Water Sample
Y-204-3-RW1-Infl-S11	5/27/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-RW1-Effl-S11	5/27/94	Groundwater Treatment System Effluent	Water Sample
Y-204-3-RW1-Infl-S12	6/7/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-RW1-Effl-S12	6/7/94	Groundwater Treatment System Effluent	Water Sample
Y-204-3-RW1-Infl-S13	6/14/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-RW1-Effl-S13	6/14/94	Groundwater Treatment System Effluent	Water Sample
Y-204-3-RW1-Infl-S14	7/19/94	Groundwater Treatment System Influent	Water Sample
Y-204-3-RW1-Effl-S14	7/19/94	Groundwater Treatment System Effluent	Water Sample

TABLE 2 - SAMPLE LOCATIONS AND DESCRIPTIONS

GROUNDWATER SAMPLES

Sample Number	Date	Sample Location (See Figure 1)	Sample Classification
Y-204-3-B1MWW3	6/30/94	Monitoring Well MW1, Water Sample No. 3	Groundwater
Y-204-3-B2MWW3	6/30/94	Monitoring Well MW2, Water Sample No. 3	Groundwater
Y-204-3-B3MWW3	6/30/94	Monitoring Well MW3, Water Sample No. 3	Groundwater

SOIL SAMPLES

Sample Number	Date	Sample Location (See Figure 1)	Sample Classification
Y-204-3-B3MWS4	5/20/94	Soil Boring B3MW, Soil Sample 4	Soil

0159

TABLE 3 - WATER SAMPLING LOG/INFLUENT AND EFFLUENT SAMPLES

0160

WATER LEVEL MEASUREMENT DATA

WELL NUMBER	B1MW	B2MW	B3MW						
DATE WATER LEVEL MEASURED	6/30/94	6/30/94	6/30/94						
TIME WATER LEVEL MEASURED	11:50	11:10	10:10						
MP ELEVATION, FT	98.20	99.07	99.40						
DEPTH TO WATER BELOW MP, FT	17.58	18.36	18.62						
WATER LEVEL ELEVATION, FT	80.62	80.71	80.78						

SAMPLING/PURGING DATA

LOCATION	B1MW	B2MW	B3MW	Infl-S8	Effl-S8	Infl-S9	Effl-S9	Infl-S10	Effl-S10
DATE SAMPLED	6/30/94	6/30/94	6/30/94	4/1/94	4/1/94	4/14/94	4/14/94	5/16/94	5/16/94
TIME SAMPLED	11:50	11:10	10:10	14:55	14:50	15:15	15:00	15:25	15:20
DEPTH TO WATER BELOW MP, FT	17.58	18.36	18.62	-	-	-	-	-	-
TOTAL DEPTH OF WELL BELOW MP, FT	29.0	29.0	27.0	-	-	-	-	-	-
WATER COLUMN IN WELL, FT	11.42	10.64	8.38	-	-	-	-	-	-
GALLONS PER FOOT	0.16	0.16	0.16	-	-	-	-	-	-
GALLONS IN WELL	1.83	1.70	1.34	-	-	-	-	-	-
TOTAL GALLONS PUMPED/BAILED	5.0	5.0	5.0	-	-	-	-	-	-
TEMPERATURE, C	7.1	6.1	7.1	11	12	7.5	9.6	11	10.7
SPECIFIC CONDUCTANCE, UMHOS/CM	1.03	0.782	0.376	0.7	0.73	0.48	0.42	0.39	0.4
pH	6.04	6.07	5.73	7.6	8.2	6.99	7	6.85	7.07
DISSOLVED OXYGEN, PPM	1.6	1.7	1.7	17.3	13.7	40.6	40.6	NM	NM
DIAMETER OF WELL CASING	2-inch	2-inch	2-inch	-	-	-	-	-	-
REMARKS									

SAMPLING/PURGING DATA

LOCATION	Infl-S11	Effl-S11	Infl-S12	Effl-S12	Infl-S13	Effl-S13	Infl-S14	Effl-S14	
DATE SAMPLED	5/27/94	5/27/94	6/7/94	6/7/94	6/14/94	6/14/94	7/19/94	7/19/94	
TIME SAMPLED	11:25	11:20	14:35	14:30	11:10	11:00	11:00	NM	
DEPTH TO WATER BELOW MP, FT	-	-	-	-	-	-	-	-	
TOTAL DEPTH OF WELL BELOW MP, FT	-	-	-	-	-	-	-	-	
WATER COLUMN IN WELL, FT	-	-	-	-	-	-	-	-	
GALLONS PER FOOT	-	-	-	-	-	-	-	-	
GALLONS IN WELL	-	-	-	-	-	-	-	-	
TOTAL GALLONS PUMPED/BAILED	-	-	-	-	-	-	-	-	
TEMPERATURE, C	11	11	10.5	6.7	7.4	16.2	14.2	NM	
SPECIFIC CONDUCTANCE, UMHOS/CM	0.59	0.59	0.407	0.524	0.396	0.32	0.69	NM	
pH	6.9	6.9	7.6	7.2	6.9	7	7.1	NM	
DISSOLVED OXYGEN, PPM	NM	NM	NM	NM	NM	NM	3.47	NM	
DIAMETER OF WELL CASING	-	-	-	-	-	-	-	-	
REMARKS									

Purging & Sampling Method: Voss Disposable Bailer
Sampling Personnel: Julie Rowland, Susan Guhl, Melisa Collett

KEY

MP = Measuring Point
NM = Not Measured
- = Sample Cannot be Measured For This Parameter

AMBIENT AIR

TABLE 4 - AMBIENT AIR AND SOIL ANALYTICAL RESULTS

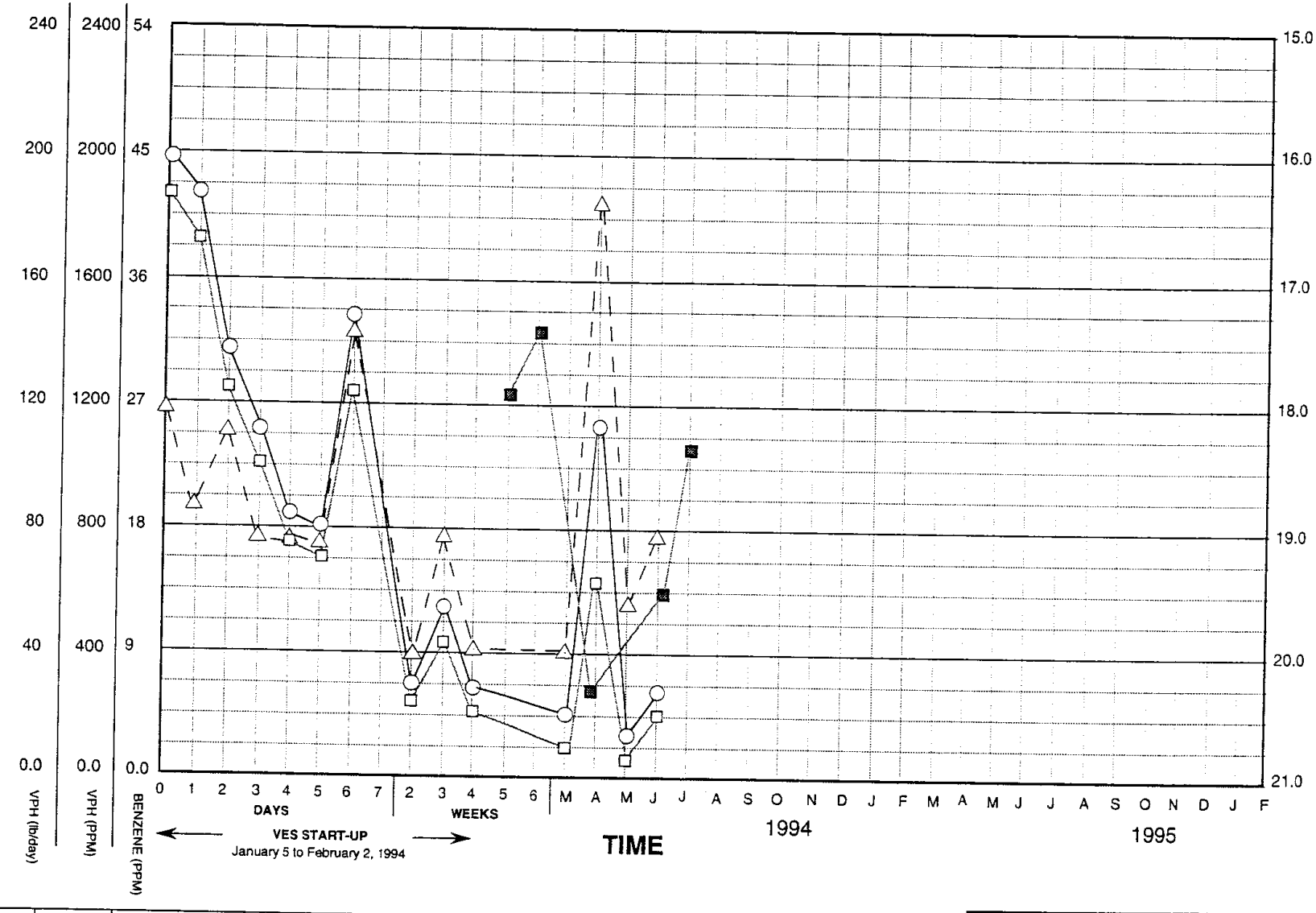
Parameter	Method*	Ambient Air Badge Sample Number (See Table 2 & Appendix A)			
		AS1-2	AS2-2	AS3-2	AS4-2
Volatile Petroleum Hydrocarbons (VPH) - ppm	EPA 5030/8015	0.0084	0.0147	0.0068	0.0100
Aromatic Volatile Organics					
Benzene - ppm	EPA 8020	0.0018	0.0038	ND	0.0022
Toluene - ppm	EPA 8020	0.0047	0.0080	0.0036	0.0056
Ethylbenzene - ppm	EPA 8020	ND	ND	ND	ND
p & m - Xylene - ppm	EPA 8020	0.0023	0.0036	0.0017	0.0026
o - Xylene - ppm	EPA 8020	ND	0.0013	ND	ND
Total BTEX - ppm	EPA 8020	0.0088	0.0167	0.0053	0.0104

Parameter	Method*	Ambient Air Badge Sample Number (See Table 2 & Appendix A)			
		AS1-3	AS2-3	AS3-3	AS4-3
Volatile Petroleum Hydrocarbons (VPH) - ppm	EPA 5030/8015	0.0985	0.0295	0.0394	0.0257
Aromatic Volatile Organics					
Benzene - ppm	EPA 8020	0.0064	0.0058	0.0037	0.0026
Toluene - ppm	EPA 8020	0.0275	0.0111	0.0092	0.0063
Ethylbenzene - ppm	EPA 8020	0.0018	0.0015	ND	ND
p & m - Xylene - ppm	EPA 8020	0.0900	0.0050	0.0044	0.0031
o - Xylene - ppm	EPA 8020	0.0032	0.0018	0.0017	0.0013
Total BTEX - ppm	EPA 8020	0.1289	0.0252	0.0190	0.0133

SOIL

Parameter	Method*	Soil Sample Number (See Table 2 & Appendix A)			
		B3MWS4			
PID Headspace reading - ppm	HNU PID	100			
Aromatic Volatile Organics					
Benzene - ppm	EPA 8020	ND			
Toluene - ppm	EPA 8020	0.064			
Ethylbenzene - ppm	EPA 8020	ND			
p & m - Xylene - ppm	EPA 8020	0.095			
o - Xylene - ppm	EPA 8020	0.14			
Total BTEX - ppm	EPA 8020	0.299			
Gasoline Range Organics (GRO) - ppm	EPA 5030/8015	18.5			
Diesel Range Organics (DRO) - ppm	EPA 3550/8100M	24.0			
Total Lead - ppm	EPA 7421	4.1			

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



SAMPLE NUMBER	DATE	DEPTH TO GROUNDWATER ■ (FT.)	VPH (lb/day) □	CONCENTRATION (PPM)	
				○ VPH	△ BENZENE
Y-204-3-VES 12	4/18/94	20.3	62	1120	41.8
Y-204-3-VES 13	5/16/94	20.3	8	124	12.8
Y-204-3-VES 14	6/14/94	19.5	19	283	17.2

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VAPOR CONCENTRATION VS. TIME TRENDS

August, 1994 Y-204-3

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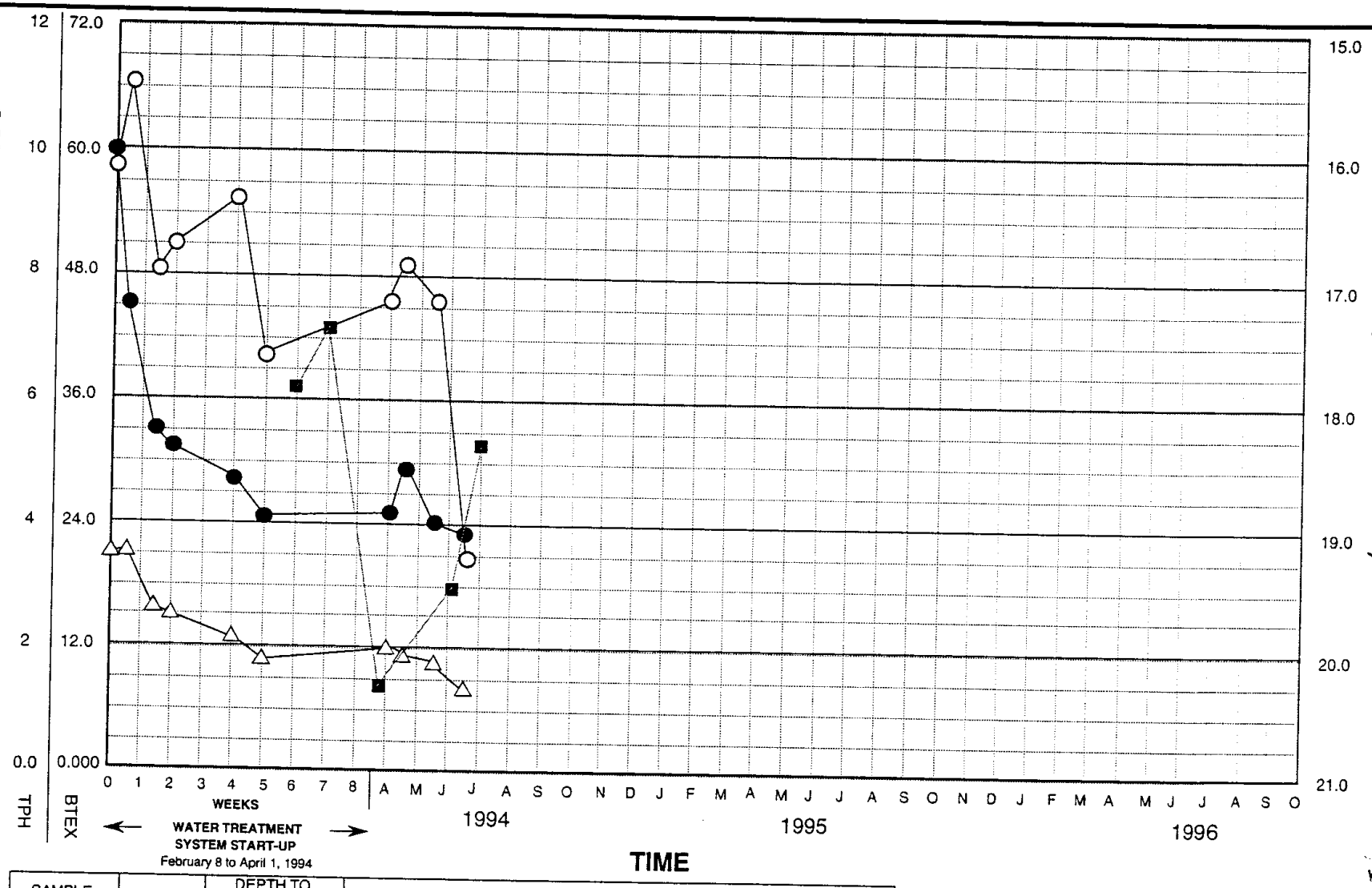
Geotechnical & Environmental Consultants

Graph 1

0162



SAMPLE NUMBER	DATE	DEPTH TO GROUNDWATER ■ (FT.)	CONCENTRATION (PPM)		
			○ TPH	△ BENZENE	● TOTAL BTEX
Infl-S8	4/1/94	20.3	7.63	12.6	24.744
Infl-S9	4/14/94	20.3	8.15	11.5	29.776
Infl-S10	5/16/94	20.3	7.65	10.3	24.013
Infl-S11	5/27/94	20.3	5.52	9.28	20.804
Infl-S12	6/7/94	19.5	5.90	8.52	18.944
Infl-S13	6/14/94	19.5	3.56	8.87	22.993
Infl-S14	7/19/94	18.36	6.25	9.93	24.365

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RECOVERY WELL RW1
INFLUENT TRENDS

August, 1994 Y-204-3

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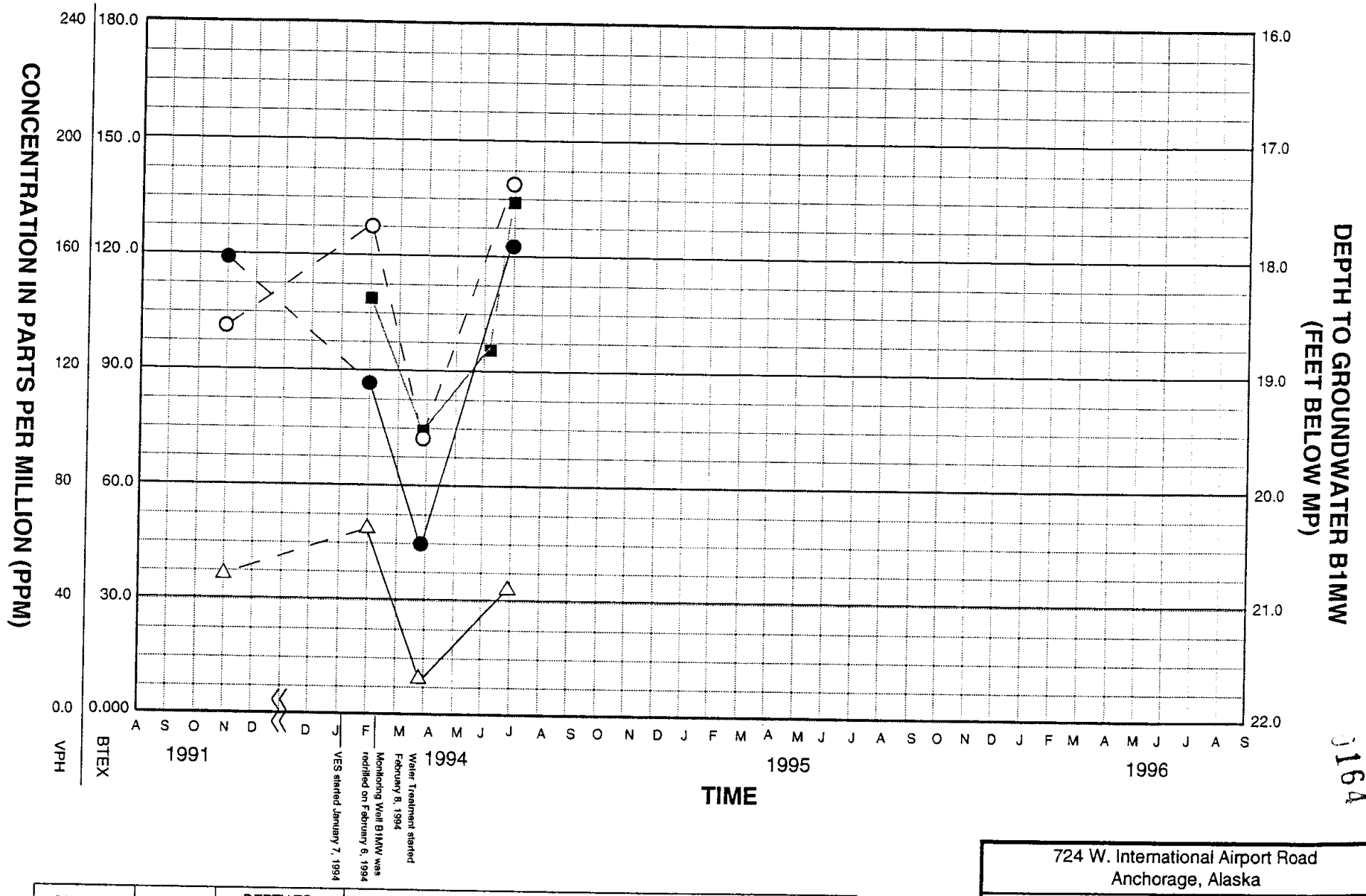
Graph 2



SAMPLE NUMBER	DATE	DEPTH TO GROUNDWATER ■ (FT.)	CONCENTRATION (PPM)		
			△ BENZENE	● TOTAL BTEX	○ VPH
B1MWW3	6/30/94	17.58	33.40	122.25	185

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MONITORING WELL B1MW TRENDS

August, 1994 Y-204-3

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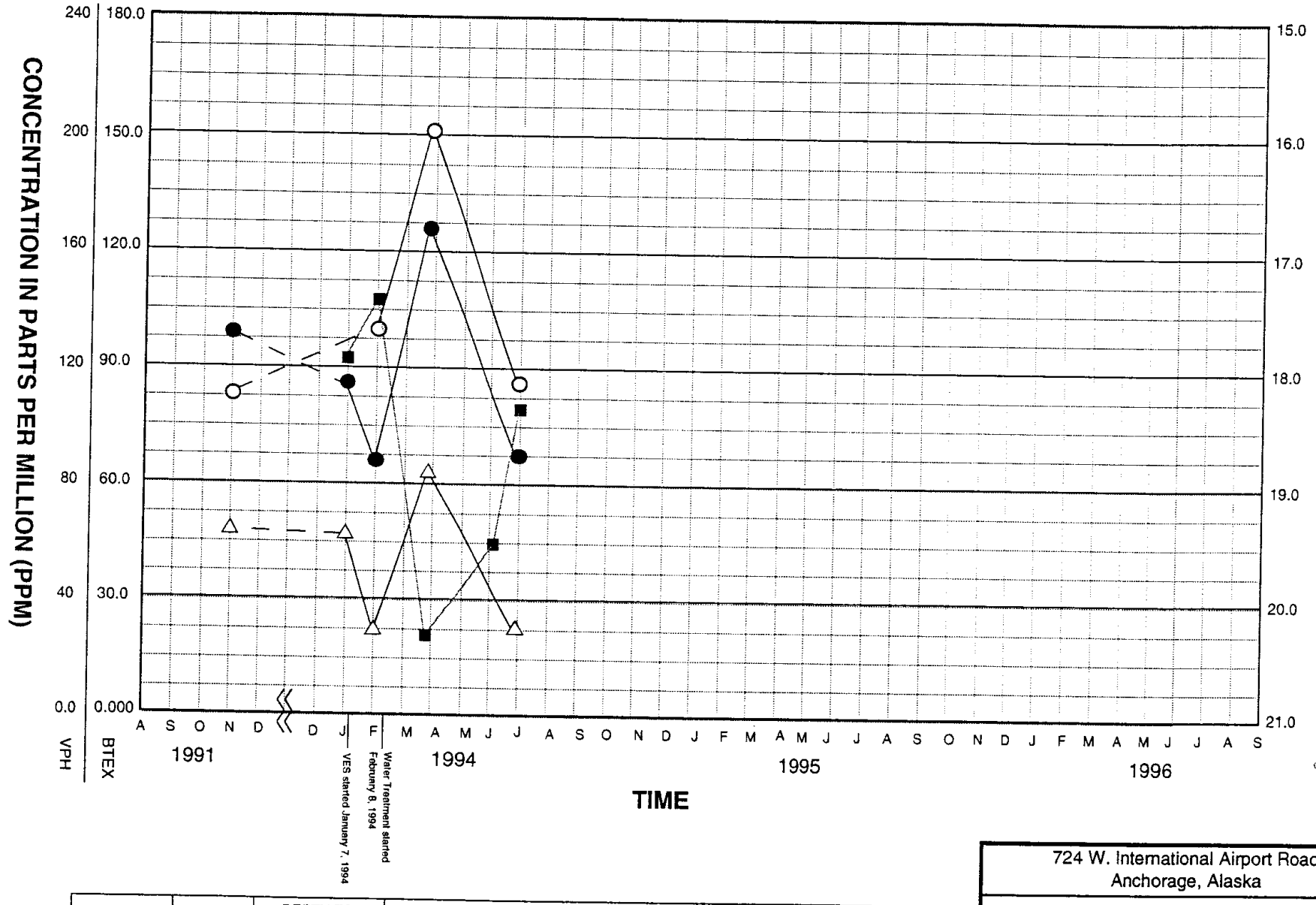
Graph 3

164



SAMPLE NUMBER	DATE	DEPTH TO GROUNDWATER ■ (FT.)	CONCENTRATION (PPM)		
			△ BENZENE	● TOTAL BTEX	○ VPH
B2MWW3	6/30/94	18.36	25.0	68.75	116

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MONITORING WELL B2MW TRENDS

August, 1994 Y-204-3

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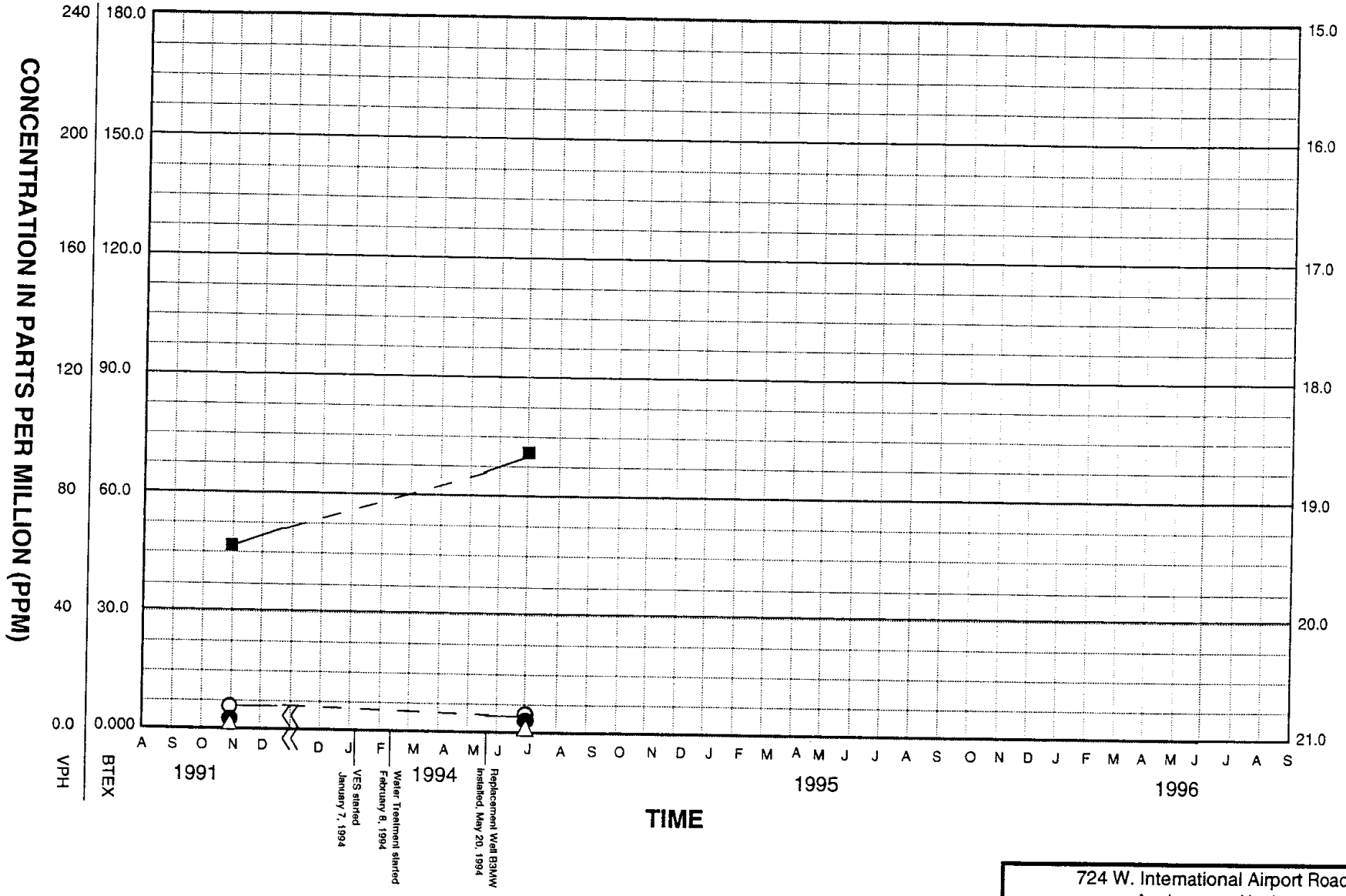
Graph 4

165



SAMPLE NUMBER	DATE	DEPTH TO GROUNDWATER ■ (FT.)	CONCENTRATION (PPM)		
			△ BENZENE	● TOTAL BTEX	○ VPH
B3MWW3	6/30/94	18.62	0.049	0.09	2.78

2166

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MONITORING WELL B3MW TRENDS

August, 1994 Y-204-3

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Graph 5

APPENDIX A

RESULTS OF ANALYTICAL TESTING BY

COMMERCIAL TESTING & ENGINEERING CO., ANCHORAGE, ALASKA

ANALYTICAL RESULTS FOR VAPOR EMISSIONS SAMPLES

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.1644-1
Client Sample ID	Y-204-3-VES12
Matrix	GAS

)169

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y-204-3
PWSID	UA

WORK Order	77491		
Printed Date	04/25/94	@09:37	hrs.
Collected Date	04/14/94	@14:45	hrs.
Received Date	04/14/94	@15:45	hrs.

Technical Director: STEPHEN C. EDE

Released By: Stephen C Ede

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	1120	D	ppm	EPA 5030/8015m			04/18/94	MDU

Benzene	41.8	D	ppm	EPA 8020			04/18/94	MDU
Toluene	57.2	D	ppm	EPA 8020			04/18/94	MDU
Ethylbenzene	1.45		ppm	EPA 8020			04/18/94	MDU
p&m Xylene	11.5		ppm	EPA 8020			04/18/94	MDU
o-Xylene	4.24		ppm	EPA 8020			04/18/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

Environmental Laboratory Services

SINCE 1908

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.2316-1
Client Sample ID	Y-204-3-VES13
Matrix	GAS

3170

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-3
PWSID	UA

WORK Order	78485		
Printed Date	05/26/94	@15:14	hrs.
Collected Date	05/16/94	@15:15	hrs.
Received Date	05/16/94	@15:54	hrs.

Technical Director STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: S.G.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	124	D	ppm	EPA 5030/8015m			05/20/94	WLS

Benzene	12.8	D	ppm	EPA 8020			05/20/94	WLS
Toluene	5.49	D	ppm	EPA 8020			05/20/94	WLS
Ethylbenzene	3.41		ppm	EPA 8020			05/20/94	WLS
p&m Xylene	11.9		ppm	EPA 8020			05/20/94	WLS
o-Xylene	4.86		ppm	EPA 8020			05/20/94	WLS

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

5633 B Street, **Anchorage, AK 99518-1600** — Tel: (907) 562-2343 Fax: (907) 561-5301

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.2921-1
Client Sample ID	Y-204-3-VES14
Matrix	GAS

3171

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-3
PWSID	UA

WORK Order	79433		
Printed Date	06/29/94	@16:30	hrs.
Collected Date	06/14/94	@10:22	hrs.
Received Date	06/14/94	@11:23	hrs.

Technical Director STEPHEN C. EDE

Released By: Shannon Parker

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	283	D	ppm	EPA 5030/8015m			06/23/94	MDU

Benzene	17.2	D	ppm	EPA 8020			06/23/94	MDU
Toluene	26.3	D	ppm	EPA 8020			06/23/94	MDU
Ethylbenzene	2.84		ppm	EPA 8020			06/23/94	MDU
p&m Xylene	14.7		ppm	EPA 8020			06/23/94	MDU
o-Xylene	6.21		ppm	EPA 8020			06/23/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

Chain of Custody Record

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

94.1644

Page 1 of ____

Laboratory CT&E

Attn: ____

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 8015 GRO	EPA 8020 BTEX	EPA 418.1 TPH	EPA 602 BTEX				Total Number of Containers	Remarks/Matrix
Y-204-3-VES12		14:45	4/14/94	X		1	1						1	Vapor Canister
Y-204-3-Infl-59		15:15	4/14/94	X				1	1				3	1 ltr / 240 ml
Y-204-3-Effl-59		15:00	4/14/94	X				1	1				3	1 ltr / 240 ml

Project Information	Sample Receipt
Project Number: Y-204-3	Total Number of Containers
Project Name: Garrett's	COC Seals/Intact Y/N/NA
Contact: Susan Guhl	Received Good Cond./Cold
Ongoing Project? Yes ☒ No ☐	Delivery Method:
Sampler: Susan Guhl	(attached shipping bill, if any)

Instructions

Requested Turn Around Time: Regular

Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan L Guhl Time: 15:45	Signature: Time:	Signature: Time:
Printed Name: SUSAN L. GUHL Date: 4/14/94	Printed Name: Date:	Printed Name: Date:
Company: S&W	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Rhonda David Time: 1545	Signature: Time:	Signature: Time:
Printed Name: Rhonda DAVID Date: 4/14/94	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

Shannon & Wilson, Inc.

Chain of Custody Record

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
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(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Page 1 of _____
Laboratory CT&E
Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

94.2316

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 5015 GRO	EPA 8020 BTEX						Total Number of Containers	Remarks/Matrix
(1) Y-204-3-VES13		15:15	5/16/94		X	X	X						1	Vapor canister

Project Information

Project Number: Y-204-3
Project Name: Gurnells
Contact: Susan Gurl
Ongoing Project? Yes [X] No [ ]
Sampler: Susan Gurl

Sample Receipt

Total Number of Containers:
COC Seals/Intact Y/N/NA:
Received Good Cond./Cold:
Delivery Method:
(attached shipping bill, if any)

Instructions

Requested Turn Around Time: REGULAR
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan Lynn Gurl Time: 13:54	Signature: Time:	Signature: Time:
Printed Name: SUSAN LYNN GURL Date: 5/16/94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 1554	Signature: Time:	Signature: Time:
Printed Name: JODY L. MAUS Date: 5/16/94	Printed Name: Da	Printed Name: Date:
Company: CT+E	Company: 94.2316	

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

2173

Shannon & Wilson, Inc.

Chain of Custody Record

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Page 1 of 1
Laboratory CT&E
Attn:

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 8015 GRO	EPA 8020 BTEX	EPA 418.1 TPH	EPA 602 BTEX				Total Number of Containers	Remarks/Matrix
Y-204-3-VES14		10:22	6/14/94		X	1	1						1	Vapor Canister
Y-204-3-Influ-S13		11:10	6/14/94		X			1	1				4	2 Hr / 240 ml
Y-204-3-Effl-S13		11:00	6/14/94		X			1					2	2 Hr

94.2921

Project Number: Y-204-3
Project Name: GUHLS
Contact: SUSAN GUHL
Ongoing Project? Yes [X] No [ ]
Sampler: SUSAN GUHL

Total Number of Containers
COC Seals/Intact Y/N/NA
Received Good Cond./Cold
Delivery Method:
(attached shipping bill, if any)

Requested Turn Around Time: REGULAR
Special Instructions:

Relinquished By 1	Relinquished By 2	Relinquished By 3
Signature: Susan L Guhl Time: 11:23	Signature: Time:	Signature: Time:
Printed Name: SUSAN L GUHL Date: 6/14/94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By 1	Received By 2	Received By 3
Signature: Judy L Maus Time: 1123	Signature: Time:	Signature: Time:
Printed Name: JUDY L. MAUS Date: 6/14/94	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - with shipment; Yellow - returned to Shannon & Wilson w/ laboratory report; Pink - Shannon & Wilson job file

ANALYTICAL RESULTS FOR WATER TREATMENT SYSTEM INFLUENT AND EFFLUENT WATER SAMPLES

Commercial Testing & Engineering Co.

Environmental Laboratory Services

SINCE 1908

LABORATORY ANALYSIS REPORT

9176

CT&E Ref.#	94.1428-1
Client Sample ID	Y-204-3-INFL-S8
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y-204-3
PWSID	UA

WORK Order	77137		
Printed Date	04/12/94	@11:41	hrs.
Collected Date	04/01/94	@14:50	hrs.
Received Date	04/01/94	@15:07	hrs.

Technical Director STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. TAG MARKED COLLECTION TIME AS 1455 HRS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	7.63		mg/L	EPA 418.1		04/06/94	04/06/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	12.6	D	mg/L	EPA 602 18AAC78		04/07/94	04/07/94	JLB
Toluene	8.95	D	mg/L	EPA 602 18AAC78		04/07/94	04/07/94	JLB
Ethylbenzene	0.703	D	mg/L	EPA 602 18AAC78		04/07/94	04/07/94	JLB
p&m Xylene	1.75	D	mg/L	EPA 602 18AAC78		04/07/94	04/07/94	JLB
o-Xylene	0.741	D	mg/L	EPA 602 18AAC78		04/07/94	04/07/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

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Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

0177

CT&E Ref.#	94.1428-2
Client Sample ID	Y-204-3-EFFL-S8
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-3
PWSID	UA

WORK Order	77137		
Printed Date	04/12/94	@ 11:41	hrs.
Collected Date	04/01/94	@ 14:55	hrs.
Received Date	04/01/94	@ 15:07	hrs.

Technical Director STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. TAG MARKED COLLECTION TIME AS 1450 HRS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	0.28		mg/L	EPA 418.1		04/06/94	04/06/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	0.0038		mg/L	EPA 602 18AAC78		04/05/94	04/05/94	JLB
Toluene	0.0041		mg/L	EPA 602 18AAC78		04/05/94	04/05/94	JLB
Ethylbenzene	0.0010	U	mg/L	EPA 602 18AAC78		04/05/94	04/05/94	JLB
p&m Xylene	0.0013		mg/L	EPA 602 18AAC78		04/05/94	04/05/94	JLB
o-Xylene	0.0010		mg/L	EPA 602 18AAC78		04/05/94	04/05/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

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Page 1 of 1

Laboratory CT&E

Attn:

94.1428

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 418.1 TPH	EPA 602 BTEX						Total Number of Containers	Remarks/Matrix
1	Y-204-3-Infl-SB		14:50	4/1/94		X	1	1						3	Water 1 Hr/2 40 ml
2	Y-204-3-Effl-SB		14:55	4/1/94		X	1	1						3	Water 1 Hr/2 40 ml

Project Information		Sample Receipt	
Project Number: Y-204-3		Total Number of Containers	
Project Name: Garretts		COC Seals/Intact Y/N/NA	
Contact: SUSAN GUHL		Received Good Cond./Cold	
Ongoing Project? Yes ☑ No ☐		Delivery Method:	
Sampler: SUSAN GUHL		(attached shipping bill, if any)	

Instructions

Requested Turn Around Time: REGULAR

Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan L. Guhl Time: 15:07	Signature: Time:	Signature: Time:
Printed Name: SUSAN L. GUHL Date: 4/1/94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time: 1507	Signature: Time:	Signature: Time:
Printed Name: JODY L. MAUS Date: 4/1/94	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

C178

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.1644-2
Client Sample ID	Y-204-3-INFL-S9
Matrix	WATER
Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-3
PWSID	UA
WORK Order	77491
Printed Date	04/25/94 @09:37 hrs.
Collected Date	04/14/94 @15:15 hrs.
Received Date	04/14/94 @15:45 hrs.
Technical Director	STEPHEN C. EDE
Released By:	Stephen C Ede

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	8.15		mg/L	EPA 418.1		04/19/94	04/19/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	11.5	D	mg/L	EPA 602 18AAC78		04/18/94	04/18/94	SPM
Toluene	8.75	D	mg/L	EPA 602 18AAC78		04/18/94	04/18/94	SPM
Ethylbenzene	0.734	D	mg/L	EPA 602 18AAC78		04/18/94	04/18/94	SPM
p&m Xylene	7.92	D	mg/L	EPA 602 18AAC78		04/18/94	04/18/94	SPM
o-Xylene	0.872	D	mg/L	EPA 602 18AAC78		04/18/94	04/18/94	SPM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.
Environmental Laboratory Services

0180

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.1644-3
Client Sample ID	Y-204-3-EFFL-S9
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y-204-3
PWSID	UA

WORK Order	77491		
Printed Date	04/25/94	@09:37	hrs.
Collected Date	04/14/94	@15:00	hrs.
Received Date	04/14/94	@15:45	hrs.

Technical Director: STEPHEN C. EDE

Released By: Stephen C Ede

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL. TAG MARKED SAMPLED AT 1300 HRS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	1.25		mg/L	EPA 418.1		04/19/94	04/19/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	4.47	D	mg/L	EPA 602 18AAC78		04/18/94	04/18/94	SPM
Toluene	3.38	D	mg/L	EPA 602 18AAC78		04/18/94	04/18/94	SPM
Ethylbenzene	0.248	D	mg/L	EPA 602 18AAC78		04/18/94	04/18/94	SPM
p&m Xylene	0.752	D	mg/L	EPA 602 18AAC78		04/18/94	04/18/94	SPM
o-Xylene	0.412	D	mg/L	EPA 602 18AAC78		04/18/94	04/18/94	SPM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

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94.1644

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Laboratory CT&E

Attn:

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp	Grab	EPA 8015 GRO	EPA 8020 BTEX	EPA 418.1 TPH	EPA 602 BTEX				Total Number of Containers	Remarks/Matrix
Y-204-3-VES12		14:45	4/14/94	X		1	1						1	Vapor canister
Y-204-3-Infl-S9		15:15	4/14/94	X				1	1				3	1 ltr / 240 ml
Y-204-3-Effl-S9		15:30	4/14/94	X				1	1				3	1 ltr / 240 ml

Project Information		Sample Receipt	
Project Number:	Y-204-3	Total Number of Containers	
Project Name:	Garrett's	COC Seals/Intact Y/N/NA	
Contact:	Susan Guhl	Received Good Cond./Cold	
Ongoing Project?	Yes ☒ No ☐	Delivery Method:	
Sampler:	Susan Guhl	(attached shipping bill, if any)	

Instructions	
Requested Turn Around Time:	Regular
Special Instructions:	

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan L Guhl Time: 15:45	Signature: Time:	Signature: Time:
Printed Name: SUSAN L. GUHL Date: 4/14/94	Printed Name: Date:	Printed Name: Date:
Company: S&W	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Rhonda David Time: 1545	Signature: Time:	Signature: Time:
Printed Name: Rhonda DAVID Date: 4/14/94	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.2315-1
Client Sample ID	Y-204-3-INFL-S10
Matrix	WATER
Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-3
PWSID	UA

RUSH Order	78479		
Printed Date	05/19/94	@ 16:26	hrs.
Collected Date	05/16/94	@ 15:25	hrs.
Received Date	05/16/94	@ 15:53	hrs.

Technical Director: STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: S.G.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	7.65		mg/L	EPA 418.1		05/17/94	05/17/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	10.3	D	mg/L	EPA 602 18AAC78		05/18/94	05/18/94	JLB
Toluene	9.65	D	mg/L	EPA 602 18AAC78		05/18/94	05/18/94	JLB
Ethylbenzene	0.835	D	mg/L	EPA 602 18AAC78		05/18/94	05/18/94	JLB
p&m Xylene	2.25	D	mg/L	EPA 602 18AAC78		05/18/94	05/18/94	JLB
o-Xylene	0.978	D	mg/L	EPA 602 18AAC78		05/18/94	05/18/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.2315-2
Client Sample ID	Y-204-3-EFFL-S10
Matrix	WATER
Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-3
PWSID	UA

RUSH Order	78479		
Printed Date	05/19/94	@ 16:26	hrs.
Collected Date	05/16/94	@ 15:20	hrs.
Received Date	05/16/94	@ 15:53	hrs.

Technical Director: STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: S.G.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	0.13		mg/L	EPA 418.1		05/17/94	05/17/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	0.427	D	mg/L	EPA 602 18AAC78		05/18/94	05/18/94	JLB
Toluene	0.391	D	mg/L	EPA 602 18AAC78		05/18/94	05/18/94	JLB
Ethylbenzene	0.100	U	mg/L	EPA 602 18AAC78		05/18/94	05/18/94	JLB
p&m Xylene	0.100	U	mg/L	EPA 602 18AAC78		05/18/94	05/18/94	JLB
o-Xylene	0.100	U	mg/L	EPA 602 18AAC78		05/18/94	05/18/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

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NA = Not Analyzed
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RUSH!!

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Laboratory CT&E

Attn:

Analysis Parameters/Sample Container Description
(include preservative if used)

94.2315

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 418.1 TPH	EPA 602 BTEX					Total Number of Containers	Remarks/Matrix
1	Y-204-3-Infl-S10		15:25	5/16/94		X	X	X						
2	Y-204-3-Effl-S10		15:20	5/16/94		X	X	X						

Project Information		Sample Receipt	
Project Number:	Y-264-3	Total Number of Containers	
Project Name:	Garrett's	COC Seals/Intact Y/N/NA	
Contact:	Susan Guhl	Received Good Cond./Cold	
Ongoing Project?	Yes ☒ No ☐	Delivery Method:	
Sampler:	Susan Guhl	(attached shipping bill, if any)	

Instructions

Requested Turn Around Time: RUSH

Special Instructions:
FAX Results a.s.a.p.!

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan Lynn Guhl Time: 15:53	Signature: Time:	Signature: Time:
Printed Name: SUSAN LYNN GUHL Date: 5/16/94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Susan Lynn Guhl Time:	Signature: Time:	Signature: Jody L. Maus Time: 1553
Printed Name: Date:	Printed Name: Date:	Printed Name: JODY L. MAUS Date: 5/16/94
Company:	Company:	Company: CT&E

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.2573-1
Client Sample ID	Y-204-3-INFL-S11
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-3
PWSID	UA

RUSH Order	78872		
Printed Date	06/06/94	@ 16:35	hrs.
Collected Date	05/27/94	@ 11:25	hrs.
Received Date	05/27/94	@ 11:55	hrs.

Technical Director STEPHEN C. EDE

Released By: S. C. E.

Sample Remarks: SAMPLE COLLECTED BY: S.L. GUHL. FINAL RESULTS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	5.52		mg/L	EPA 418.1		06/03/94	06/03/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	9.28	D	mg/L	EPA 602 18AAC78		05/31/94	05/31/94	JLB
Toluene	8.10	D	mg/L	EPA 602 18AAC78		05/31/94	05/31/94	JLB
Ethylbenzene	0.717	D	mg/L	EPA 602 18AAC78		05/31/94	05/31/94	JLB
p&m Xylene	1.89	D	mg/L	EPA 602 18AAC78		05/31/94	05/31/94	JLB
o-Xylene	0.817	D	mg/L	EPA 602 18AAC78		05/31/94	05/31/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.2573-2
Client Sample ID	Y-204-3-EFFL-S11
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-3
PWSID	UA

RUSH Order	78872		
Printed Date	06/06/94	@ 16:36	hrs.
Collected Date	05/27/94	@ 11:20	hrs.
Received Date	05/27/94	@ 11:55	hrs.

Technical Director: STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: S.L. GUHL. FINAL RESULTS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	0.20	U	mg/L	EPA 418.1		06/03/94	06/03/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	0.536	D	mg/L	EPA 602 18AAC78		05/31/94	05/31/94	JLB
Toluene	0.459	D	mg/L	EPA 602 18AAC78		05/31/94	05/31/94	JLB
Ethylbenzene	0.035		mg/L	EPA 602 18AAC78		05/28/94	05/28/94	JLB
p&m Xylene	0.094		mg/L	EPA 602 18AAC78		05/28/94	05/28/94	JLB
o-Xylene	0.043		mg/L	EPA 602 18AAC78		05/28/94	05/28/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

94.2573

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Chain of Custody Record

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Laboratory CT&E
Attn: ____

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 8015 GRO	EPA 602 BTEX						Total Number of Containers	Remarks/Matrix
V-204-3-Full-511		11:24	5/27/94		X	1	1						4	2 ltr/2 40ml
V-204-3-Eff-511		11:20	5/27/94			1	1						4	2 ltr/2 40ml

Project Information	Sample Receipt
Project Number: V-204-3	Total Number of Containers
Project Name: Exxon 45	COC Seals/Intact Y/N/NA
Contact: S.L. Guhl	Received Good Cond./Cold
Ongoing Project? Yes ☑ No ☐	Delivery Method:
Sampler: S.L. Guhl	(attached shipping bill, if any)

Instructions

Requested Turn Around Time: 72 HR for BTEX

Special Instructions: BTEX-602 - 72 HR RUSH
TPH - Regular Turnaround

Relinquished By 1	Relinquished By 2	Relinquished By 3
Signature: Susan L Guhl Time: 11:55	Signature: Time:	Signature: Time:
Printed Name: SUSAN L GUHL Date: 5/27/94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By 1	Received By 2	Received By 3
Signature: Time: 11:55	Signature: Time:	Signature: Time:
Printed Name: Date: 5/27/94	Printed Name: Date:	Printed Name: Date:
Company: C.T.&E.	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

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Commercial Testing & Engineering Co.
Environmental Laboratory Services

)188

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.2773-1
Client Sample ID	Y-204-3-INFL-S12
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS TESORO
Project#	Y-204-3
PWSID	UA

WORK Order	79185		
Printed Date	06/16/94	@ 11:28	hrs.
Collected Date	06/07/94	@ 14:35	hrs.
Received Date	06/07/94	@ 15:50	hrs.

Technical Director STEPHEN C. EDE

Released By: S Thomas Preston

Sample Remarks: SAMPLE COLLECTED BY: RUSS SCHWAB.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	5.90		mg/L	EPA 418.1		06/14/94	06/15/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	8.52	D	mg/L	EPA 602 18AAC78		06/15/94	06/15/94	JLB
Toluene	7.15	D	mg/L	EPA 602 18AAC78		06/15/94	06/15/94	JLB
Ethylbenzene	0.681	D	mg/L	EPA 602 18AAC78		06/15/94	06/15/94	JLB
p&m Xylene	1.72	D	mg/L	EPA 602 18AAC78		06/15/94	06/15/94	JLB
o-Xylene	0.873	D	mg/L	EPA 602 18AAC78		06/15/94	06/15/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

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Commercial Testing & Engineering Co.

Environmental Laboratory Services

0189

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.2773-2
Client Sample ID	Y-204-3-EFFL-S2
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS TESORO
Project#	Y-204-3
PWSID	UA

WORK Order	79185		
Printed Date	06/16/94	@ 11:28	hrs.
Collected Date	06/07/94	@ 14:30	hrs.
Received Date	06/07/94	@ 15:50	hrs.

Technical Director STEPHEN C. EDE

Released By: S. Hanson Parker

Sample Remarks: SAMPLE COLLECTED BY: RUSS SCHWAB.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	0.20	U	mg/L	EPA 418.1		06/14/94	06/15/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	0.0010	U	mg/L	EPA 602 18AAC78		06/12/94	06/12/94	JLB
Toluene	0.0010	U	mg/L	EPA 602 18AAC78		06/12/94	06/12/94	JLB
Ethylbenzene	0.0010	U	mg/L	EPA 602 18AAC78		06/12/94	06/12/94	JLB
p&m Xylene	0.0013		mg/L	EPA 602 18AAC78		06/12/94	06/12/94	JLB
o-Xylene	0.0010	U	mg/L	EPA 602 18AAC78		06/12/94	06/12/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

Chain of Custody Record

400 N. 34th Street, Suite 100
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Page 1 of ____
Laboratory CT&E
Attn: ____

Analysis Parameters/Sample Container Description
(include preservative if used)

94.2773

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 418.1 TPH	EPA 602 BTEX						Total Number of Containers	Remarks/Matrix
1	Y-204-3-Infl-S12		14:35	6/7/94		X	1	1						4	2 hr/240-ml
2	Y-204-3-Effl-S2		14:30	6/7/94		X	1	1						4	2 hr/240-ml

Project Information	Sample Receipt
Project Number: Y-204-3	Total Number of Containers
Project Name: Garrells Farm	COC Seals/Intact Y/N/NA
Contact: SUSAN GUHL	Received Good Cond./Cold
Ongoing Project? Yes ☑ No ☐	Delivery Method:
Sampler: RUSS SCHWABB	(attached shipping bill, if any)

Instructions

Requested Turn Around Time: REGULAR

Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 13:50	Signature: Time:	Signature: Time:
Printed Name: Russell Schwab Date: 6-7-94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson, Inc.	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Time: 1530	Signature: Time:	Signature: Time:
Printed Name: JODY L. MAUG Date: 6/7/94	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

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Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.2921-2
Client Sample ID	Y-204-3-INFL-S13
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-3
PWSID	UA

WORK Order	79433		
Printed Date	06/29/94	@16:30	hrs.
Collected Date	06/14/94	@11:10	hrs.
Received Date	06/14/94	@11:23	hrs.

Technical Director STEPHEN C. EDE

Released By: Shannon Parker

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	3.56		mg/L	EPA 418.1		06/23/94	06/23/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	8.87	D	mg/L	EPA 602 18AAC78		06/28/94	06/28/94	MCM
Toluene	9.26	D	mg/L	EPA 602 18AAC78		06/28/94	06/28/94	MCM
Ethylbenzene	0.933	D	mg/L	EPA 602 18AAC78		06/28/94	06/28/94	MCM
p,&m Xylene	2.82	D	mg/L	EPA 602 18AAC78		06/28/94	06/28/94	MCM
o-Xylene	1.11	D	mg/L	EPA 602 18AAC78		06/28/94	06/28/94	MCM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.
Environmental Laboratory Services

0192

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.2921-3
Client Sample ID	Y-204-3-EFFL-S13
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-3
PWSID	UA

WORK Order	79433		
Printed Date	06/29/94	@16:30	hrs.
Collected Date	06/14/94	@11:00	hrs.
Received Date	06/14/94	@11:23	hrs.

Technical Director STEPHEN C. EDE

Released By

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	0.20	U	mg/L	EPA 418.1		06/23/94	06/23/94	SMK

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

Chain of Custody Record

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Laboratory CT&E
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Analysis Parameters/Sample Container Description
(include preservative if used)

94.2921

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 5015 GRO	EPA 8020 BTEX	EPA 418.1 TPH	EPA 602 BTEX				Total Number of Containers	Remarks/Matrix
Y-204-3-VES14		10:22	6/14/94		X	1	1						1	Vapor Canister
Y-204-3-Infl-S13		11:10	6/14/94		X			1	1				4	2 Hr / 240 ml
Y-204-3-Effl-S13		11:00	6/14/94		X			1					2	2 Hr

Project Information

Project Number: Y-204-3
Project Name: Garrett's
Contact: SUSAN GUHL
Ongoing Project? Yes [X] No [ ]
Sampler: SUSAN GUHL

Sample Receipt

Total Number of Containers:
COC Seals/Intact Y/N/NA:
Received Good Cond./Cold:
Delivery Method:
(attached shipping bill, if any)

Instructions

Requested Turn Around Time: REGULAR
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan L Guhl Time: 11:23	Signature: Time:	Signature: Time:
Printed Name: SUSAN L. GUHL Date: 6/14/94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Jody L Maus Time: 1123	Signature: Time:	Signature: Time:
Printed Name: JODY L. MAUS Date: 6/14/94	Printed Name: Date:	Printed Name: Date:
Company: CT+E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

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Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.2920-1
Client Sample ID	Y-204-3-EFFL-SB
Matrix	WATER
Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-2
PWSID	UA

RUSH Order	79432		
Printed Date	06/15/94	@ 15:55	hrs.
Collected Date	06/14/94	@ 11:00	hrs.
Received Date	06/14/94	@ 11:22	hrs.

Technical Director: STEPHEN C. EDE

Released By: Shannon Parker

Sample Remarks: SAMPLE COLLECTED BY: SUSAN GUHL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	0.058		mg/L	EPA 602 18AAC78		06/14/94	06/14/94	SPM
Toluene	0.055		mg/L	EPA 602 18AAC78		06/14/94	06/14/94	SPM
Ethylbenzene	0.0036		mg/L	EPA 602 18AAC78		06/14/94	06/14/94	SPM
p&m Xylene	0.019		mg/L	EPA 602 18AAC78		06/14/94	06/14/94	SPM
o-Xylene	0.011		mg/L	EPA 602 18AAC78		06/14/94	06/14/94	SPM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

94.2920

Shannon & Wilson, Inc.

Chain of Custody Record

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Seattle, WA 98103
(206) 632-8020

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St. Louis, MO 63141
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Laboratory CT&E
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Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 602 BTEX							Total Number of Containers	Remarks/Matrix
(1)	Y-204-3-Eff-SW		11:00	6/14/94		X	1							2	40-ml vials
															94.2920

Project Information	
Project Number: Y-264-3	
Project Name: Garrett's	
Contact: SUSAN GUHL	
Ongoing Project? Yes ☑ No ☐	
Sampler: SUSAN GUHL	

Sample Receipt	
Total Number of Containers	
COC Seals/Intact Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attached shipping bill, if any)	

Instructions

Requested Turn Around Time: RUSH!

Special Instructions: FAX results a.s.a.p.

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Susan L. Guhl Time: 11:22	Signature: Time:	Signature: Time:
Printed Name: SUSAN L. GUHL Date: 6/14/94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Jody L. Maus Time: 1122	Signature: Time:	Signature: Time:
Printed Name: JODY L. MAUS Date: 6/14/94	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

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Commercial Testing & Engineering Co.
Environmental Laboratory Services

0196

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3640-1
Client Sample ID	RW1-INFL-S14
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204
PWSID	UA

RUSH Order	80529		
Printed Date	07/26/94	@11:16	hrs.
Collected Date	07/19/94	@	hrs.
Received Date	07/19/94	@11:28	hrs.

Technical Director: STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: MLC/JZ. FINAL RESULTS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	6.25		mg/L	EPA 418.1		07/21/94	07/21/94	JS
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	9.93	D	mg/L	EPA 602 18AAC78		07/20/94	07/20/94	JLB
Toluene	9.66	D	mg/L	EPA 602 18AAC78		07/20/94	07/20/94	JLB
Ethylbenzene	0.975	D	mg/L	EPA 602 18AAC78		07/20/94	07/20/94	JLB
ρ&m Xylene	2.57	D	mg/L	EPA 602 18AAC78		07/20/94	07/20/94	JLB
o-Xylene	1.23	D	mg/L	EPA 602 18AAC78		07/20/94	07/20/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
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LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3640-2
Client Sample ID	RW1-EFFLU-S14
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204
PWSID	UA

RUSH Order	80529		
Printed Date	07/26/94	@11:16	hrs.
Collected Date	07/19/94	@	hrs.
Received Date	07/19/94	@11:28	hrs.

Technical Director: STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: MLC/JZ. FINAL RESULTS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	0.20	U	mg/L	EPA 418.1		07/21/94	07/21/94	JS
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	0.0023		mg/L	EPA 602 18AAC78		07/19/94	07/19/94	JLB
Toluene	0.0029		mg/L	EPA 602 18AAC78		07/19/94	07/19/94	JLB
Ethylbenzene	0.0010	U	mg/L	EPA 602 18AAC78		07/19/94	07/19/94	JLB
p&m Xylene	0.0015		mg/L	EPA 602 18AAC78		07/19/94	07/19/94	JLB
o-Xylene	0.0011		mg/L	EPA 602 18AAC78		07/19/94	07/19/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

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NA = Not Analyzed
LT = Less Than
GT = Greater Than

RETURN TO 3.1

Shannon & Wilson, Inc.

Chain of Custody Record

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Page 1 of 1

Laboratory CT+E

Attn: _____

94.3640

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	BTEX EPA 602	TPH EPA 418.1					Total Number of Containers	Remarks/Matrix
1	RW 1-Infl-S14			7-19-94			X	X					4	water
2	RW1-Efflu-S14			7-19-94			X	X					4	water

Project Information	
Project Number: Y204	
Project Name: Garretts	
Contact: Susan Guth	
Ongoing Project? Yes ☒ No ☐	
Sampler: MLC / JZ	

Sample Receipt	
Total Number of Containers	
COC Seals/Intact Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attached shipping bill, if any)	

Instructions

Requested Turn Around Time: Rush BTEX

Special Instructions: Regular TPH

Relinquished By: 1	Relinquished By: 2	Relinquished By: 3
Signature: Melissa L. Collett Time: 1120	Signature: Time:	Signature: Time:
Printed Name: Melisa L. Collett Date: 7-19-94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1	Received By: 2	Received By: 3
Signature: John L Maus Time: 1428	Signature: Time:	Signature: Time:
Printed Name: Joey L. Maus Date: 7/19/94	Printed Name: Date:	Printed Name: Date:
Company: CT+E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

C198

ANALYTICAL RESULTS FOR
VAPOR AMBIENT AIR SAMPLES

Commercial Testing & Engineering Co.

Environmental Laboratory Services

0200

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3219-1
Client Sample ID	Y204-3 ASI-2
Matrix	OTHER

Client Name	SHANNON & WILSON, INC.
Ordered By	S. GUHL
Project Name	GARRETTS
Project#	Y204-3
PWSID	UA

WORK Order	79896		
Printed Date	07/11/94	@ 15:18	hrs.
Collected Date		@	hrs.
Received Date	06/28/94	@ 14:30	hrs.

Technical Director STEPHEN C. EDE

Released By

Sample Remarks: SAMPLE COLLECTED BY: M.C./J.R. MATRIX = VAPOR CANISTERS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.0084		ppm	EPA 5030/8015m		07/05/94	07/05/94	MDU

Benzene	0.0018		ppm	EPA 8020		07/05/94	07/05/94	MDU
Toluene	0.0047		ppm	EPA 8020		07/05/94	07/05/94	MDU
Ethylbenzene	0.0011	U	ppm	EPA 8020		07/05/94	07/05/94	MDU
p&m Xylene	0.0023		ppm	EPA 8020		07/05/94	07/05/94	MDU
o-Xylene	0.0011	U	ppm	EPA 8020		07/05/94	07/05/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

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Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3219-2
Client Sample ID	Y204-3 AS2-2
Matrix	OTHER

Client Name	SHANNON & WILSON, INC.
Ordered By	S. GUHL
Project Name	GARRETTS
Project#	Y204-3
PWSID	UA

WORK Order	79896		
Printed Date	07/11/94	@ 15:18	hrs.
Collected Date		@	hrs.
Received Date	06/28/94	@ 14:30	hrs.

Technical Director STEPHEN C. EDE

Released By:

Sample Remarks: SAMPLE COLLECTED BY: M.C./J.R. MATRIX = VAPOR CANISTERS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.0147		ppm	EPA 5030/8015m		07/05/94	07/06/94	MDU

Benzene	0.0038		ppm	EPA 8020		07/05/94	07/06/94	MDU
Toluene	0.0080		ppm	EPA 8020		07/05/94	07/06/94	MDU
Ethylbenzene	0.0011	U	ppm	EPA 8020		07/05/94	07/06/94	MDU
p&m Xylene	0.0036		ppm	EPA 8020		07/05/94	07/06/94	MDU
o-Xylene	0.0013		ppm	EPA 8020		07/05/94	07/06/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3219-3
Client Sample ID	Y204-3 AS3-2
Matrix	OTHER

Client Name	SHANNON & WILSON, INC.	WORK Order	79896	
Ordered By	S. GUHL	Printed Date	07/11/94	@ 15:18 hrs.
Project Name	GARRETTS	Collected Date		@ hrs.
Project#	Y204-3	Received Date	06/28/94	@ 14:30 hrs.
PWSID	UA			

Technical Director: STEPHEN C. EDE

Released By: [signature]

Sample Remarks: SAMPLE COLLECTED BY: M.C./J.R. MATRIX = VAPOR CANISTERS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.0068		ppm	EPA 5030/8015m		07/05/94	07/06/94	MDU

Benzene	0.0012	U	ppm	EPA 8020		07/05/94	07/06/94	MDU
Toluene	0.0036		ppm	EPA 8020		07/05/94	07/06/94	MDU
Ethylbenzene	0.0012	U	ppm	EPA 8020		07/05/94	07/06/94	MDU
p&m Xylene	0.0017		ppm	EPA 8020		07/05/94	07/06/94	MDU
o-Xylene	0.0012	U	ppm	EPA 8020		07/05/94	07/06/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3219-4
Client Sample ID	Y204-3 AS4-2
Matrix	OTHER

Client Name	SHANNON & WILSON, INC.	WORK Order	79896	
Ordered By	S. GUHL	Printed Date	07/11/94	@ 15:18 hrs.
Project Name	GARRETTS	Collected Date		@ hrs.
Project#	Y204-3	Received Date	06/28/94	@ 14:30 hrs.
PWSID	UA			

Technical Director STEPHEN C. EDE

Released By

Sample Remarks: SAMPLE COLLECTED BY: M.C./J.R. MATRIX = VAPOR CANISTERS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.0100		ppm	EPA 5030/8015m		07/05/94	07/06/94	MDU

Benzene	0.0022		ppm	EPA 8020		07/05/94	07/06/94	MDU
Toluene	0.0056		ppm	EPA 8020		07/05/94	07/06/94	MDU
Ethylbenzene	0.0011	U	ppm	EPA 8020		07/05/94	07/06/94	MDU
p&m Xylene	0.0026		ppm	EPA 8020		07/05/94	07/06/94	MDU
o-Xylene	0.0011	U	ppm	EPA 8020		07/05/94	07/06/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

Chain of Custody Record

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

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Laboratory CT&E

Attn: _____

94.3219

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time (military)	Date Sampled	Comp.	Grab	EPA 8020 BTEX	EPA 8015 VPH							Total Number of Containers	Remarks/Matrix
1	Y204-3 AS1-2		5700 min.	6-24 to 6-25-94			X	X							1	3520 Organic vapor monitor
2	Y204-3 AS2-2		5690 min	"			X	X							1	"
3	Y204-3 AS3-X2		5690 min	"			X	X							1	"
4	Y204-3 AS4-2		5700 min	"			X	X							1	"

Project Information

Project Number: Y204-3
Project Name: Garretts
Contact: S. Guhl
Ongoing Project? Yes [X] No [ ]
Sampler: M.C. / J.R.

Sample Receipt

Total Number of Containers	
COC Seals/Intact Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attached shipping bill, if any)	

Instructions

Requested Turn Around Time: regular

Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Melissa L. Collett Time: 14:30	Signature: Time:	Signature: Time:
Printed Name: Melissa L. Collett Date: 6-28-94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Jody L. Maus Time: 1450	Signature: Time:	Signature: Time:
Printed Name: JODY L. MAUS Date: 6/28/94	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

12/94

SINCE 1908

Commercial Testing & Engineering Co.

Environmental Laboratory Services

0205

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3734-1
Client Sample ID	Y-204-3 ASI-3
Matrix	OTHER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y204-3
PWSID	UA

WORK Order	80673		
Printed Date	08/03/94	@14:30	hrs.
Collected Date		@	hrs.
Received Date	07/23/94	@12:10	hrs.

Technical Director STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: MLC/JAZ. MATRIX = BADGES.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.0985		ppm	EPA 5030/8015m		08/02/94	08/02/94	MDU

Benzene	0.0064		ppm	EPA 8020		08/02/94	08/02/94	MDU
Toluene	0.0275		ppm	EPA 8020		08/02/94	08/02/94	MDU
Ethylbenzene	0.0018		ppm	EPA 8020		08/02/94	08/02/94	MDU
p&m Xylene	0.0090		ppm	EPA 8020		08/02/94	08/02/94	MDU
o-Xylene	0.0032		ppm	EPA 8020		08/02/94	08/02/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3734-2
Client Sample ID	Y204-3 AS2-3
Matrix	OTHER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y204-3
PWSID	UA

WORK Order	80673		
Printed Date	08/03/94	@ 14:24	hrs.
Collected Date		@	hrs.
Received Date	07/23/94	@ 12:10	hrs.

Technical Director: STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: MLC/JAZ. MATRIX = BADGES.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.0295		ppm	EPA 5030/8015m		08/02/94	08/02/94	JLB

Benzene	0.0058		ppm	EPA 8020		08/02/94	08/02/94	JLB
Toluene	0.0111		ppm	EPA 8020		08/02/94	08/02/94	JLB
Ethylbenzene	0.0015		ppm	EPA 8020		08/02/94	08/02/94	JLB
p&m Xylene	0.0050		ppm	EPA 8020		08/02/94	08/02/94	JLB
o-Xylene	0.0018		ppm	EPA 8020		08/02/94	08/02/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3734-3
Client Sample ID	Y204-3 AS3-3
Matrix	OTHER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y204-3
PWSID	UA

WORK Order	80673		
Printed Date	08/03/94	@ 14:24	hrs.
Collected Date		@	hrs.
Received Date	07/23/94	@ 12:10	hrs.

Technical Director: STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: MLC/JAZ. MATRIX = BADGES.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.0394		ppm	EPA 5030/8015m		08/02/94	08/02/94	MDU

Benzene	0.0037		ppm	EPA 8020		08/02/94	08/02/94	MDU
Toluene	0.0092		ppm	EPA 8020		08/02/94	08/02/94	MDU
Ethylbenzene	0.0010	U	ppm	EPA 8020		08/02/94	08/02/94	MDU
p&m Xylene	0.0044		ppm	EPA 8020		08/02/94	08/02/94	MDU
o-Xylene	0.0017		ppm	EPA 8020		08/02/94	08/02/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3734-4
Client Sample ID	Y204-3 AS4-3
Matrix	OTHER

Client Name	SHANNON & WILSON, INC.	WORK Order	80673	
Ordered By	SUSAN GUHL	Printed Date	08/03/94	@ 14:24 hrs.
Project Name	GARRETTS	Collected Date		@ hrs.
Project#	Y204-3	Received Date	07/23/94	@ 12:10 hrs.
PWSID	UA			

Technical Director: STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: MLC/JAZ. MATRIX = BADGES.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.0257		ppm	EPA 5030/8015m		08/02/94	08/02/94	MDU

Benzene	0.0026		ppm	EPA 8020		08/02/94	08/02/94	MDU
Toluene	0.0063		ppm	EPA 8020		08/02/94	08/02/94	MDU
Ethylbenzene	0.0010	U	ppm	EPA 8020		08/02/94	08/02/94	MDU
p&m Xylene	0.0031		ppm	EPA 8020		08/02/94	08/02/94	MDU
o-Xylene	0.0013		ppm	EPA 8020		08/02/94	08/02/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

94.3734

Chain of Custody Record

Shannon & Wilson, Inc.

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

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5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Page 1 of 1

Laboratory CT+E

Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time (minutes)	Date Sampled	Comp.	Grab	EPA 8020 BTEX	EPA 8015 VPH					Total Number of Containers	Remarks/Matrix
1	Y-204-3 AS1-3		5912	7-19 to 7-23-94			X	X					1	3520 organic vapor monitor
2	Y204-3 AS2-3		5814	"			X	X					1	"
3	Y204-3 AS3-3		5797	"			X	X					1	"
4	Y204-3 AS4-3		5802	"			X	X					1	"

Project Information	
Project Number: Y204-3	
Project Name: Garrett's	
Contact: Susan Guhl	
Ongoing Project? Yes ☒ No ☐	
Sampler: MLC / JAZ	

Sample Receipt	
Total Number of Containers	4
COC Seals/Intact Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attached shipping bill, if any)	

Instructions

Requested Turn Around Time: regular

Special Instructions:
Pls. FAX results

Relinquished By: 1	Relinquished By: 2	Relinquished By: 3
Signature: James A Zachan Time: 1210	Signature: Time:	Signature: Time:
Printed Name: James A. Zachan Date: 7-23-94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1	Received By: 2	Received By: 3
Signature: Laura Hopkins Time: 12:10	Signature: Time:	Signature: Time:
Printed Name: Laura Hopkins Date: 7-23-94	Printed Name: Date:	Printed Name: Date:
Company: C.T.+E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

9225

ANALYTICAL RESULTS FOR
GROUNDWATER MONITORING WELL SAMPLES

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3278-1
Client Sample ID	Y-204-3-B1MWW3
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-3
PWSID	UA

RUSH Order	79964		
Printed Date	07/01/94	@16:33	hrs.
Collected Date	06/30/94	@11:50	hrs.
Received Date	06/30/94	@13:00	hrs.

Technical Director STEPHEN C. EDE

Released By: Shannon Parker

Sample Remarks: SAMPLE COLLECTED BY: JULIE ROWLAND.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				5030/8015M/602				
Hydrocarbons VPH	185	D	mg/L	EPA 5030/8015m		06/30/94	06/30/94	SPM

Benzene	33.4	D	mg/L	EPA 602		06/30/94	06/30/94	SPM
Toluene	47.5	D	mg/L	EPA 602		06/30/94	06/30/94	SPM
Ethylbenzene	8.15	D	mg/L	EPA 602		06/30/94	06/30/94	SPM
p & m Xylene	26.2	D	mg/L	EPA 602		06/30/94	06/30/94	SPM
o-Xylene	7.00	D	mg/L	EPA 602		06/30/94	06/30/94	SPM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3278-2
Client Sample ID	Y-204-3-B2MWW3
Matrix	WATER
Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-3
PWSID	UA

RUSH Order	79964		
Printed Date	07/01/94	@16:33	hrs.
Collected Date	06/30/94	@11:10	hrs.
Received Date	06/30/94	@13:00	hrs.

Technical Director: STEPHEN C. EDE

Released By: Shannon Parker

Sample Remarks: SAMPLE COLLECTED BY: JULIE ROWLAND.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				5030/8015M/602				
Hydrocarbons VPH	116	D	mg/L	EPA 5030/8015m		06/30/94	06/30/94	SPM

Benzene	25.0	D	mg/L	EPA 602		06/30/94	06/30/94	SPM
Toluene	26.9	D	mg/L	EPA 602		06/30/94	06/30/94	SPM
Ethylbenzene	3.40	D	mg/L	EPA 602		06/30/94	06/30/94	SPM
p & m Xylene	9.45	D	mg/L	EPA 602		06/30/94	06/30/94	SPM
o-Xylene	4.00	D	mg/L	EPA 602		06/30/94	06/30/94	SPM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3278-3
Client Sample ID	Y-204-3-B3MWW3
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-3
PWSID	UA

RUSH Order	79964		
Printed Date	07/01/94	@16:33	hrs.
Collected Date	06/30/94	@10:05	hrs.
Received Date	06/30/94	@13:00	hrs.

Technical Director STEPHEN C. EDE

Released By: Shannon Parker

Sample Remarks: SAMPLE COLLECTED BY: JULIE ROWLAND.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				5030/8015M/602				
Hydrocarbons VPH	2.78		mg/L	EPA 5030/8015m		07/01/94	07/01/94	SPM

Benzene	0.049		mg/L	EPA 602		07/01/94	07/01/94	SPM
Toluene	0.033		mg/L	EPA 602		07/01/94	07/01/94	SPM
Ethylbenzene	0.0062		mg/L	EPA 602		07/01/94	07/01/94	SPM
p & m Xylene	0.0014		mg/L	EPA 602		07/01/94	07/01/94	SPM
o-Xylene	0.0014		mg/L	EPA 602		07/01/94	07/01/94	SPM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.2443-1
Client Sample ID	Y-204-3 B3MWS4
Matrix	SOIL

Client Name	SHANNON & WILSON, INC.	WORK Order	78673	
Ordered By	SUSAN GUHL	Printed Date	06/08/94	@13:29 hrs.
Project Name	GARRETTS	Collected Date	05/20/94	@09:50 hrs.
Project#	Y-204-3	Received Date	05/20/94	@16:30 hrs.
PWSID	UA			

Technical Director: STEPHEN C. EDE

Released By:

Sample Remarks: SAMPLE COLLECTED BY: L. MINER. 19.8 MG/KG OF EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	82.3		%	SM172540G			05/24/94	ALN
Hydrocarbons EPH	24.0		mg/Kg	3510/3550/8100M		05/30/94	05/31/94	JBH
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	18.5		mg/Kg	EPA 5030/8015m		05/24/94	05/28/94	SPM

Benzene	0.030	U	mg/Kg	EPA 8020		05/24/94	05/28/94	SPM
Toluene	0.064		mg/Kg	EPA 8020		05/24/94	05/28/94	SPM
Ethylbenzene	0.030	U	mg/Kg	EPA 8020		05/24/94	05/28/94	SPM
p&m Xylene	0.095		mg/Kg	EPA 8020		05/24/94	05/28/94	SPM
o-Xylene	0.140		mg/Kg	EPA 8020		05/24/94	05/28/94	SPM
Sample Preparation	---			EPA 3050 Digest				
Lead	4.1		mg/Kg	EPA 7421 GF		06/01/94	06/02/94	BMW

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

94.3276

Shannon & Wilson, Inc.

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Chain of Custody Record

Page 1 of 1

Laboratory CT&E

Attn: Randy Brandt and Gene Yankie

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 602 BTEX	EPA 8015 GRO						Total Number of Containers	Remarks/Matrix
Y-304-3-B1MW1W3		11:50	6/30			✓	✓						4	WATER
Y-304-3-B2MW2W3		1:20	6/30			✓	✓						4	WATER
Y-304-3-B3MW3W3		12:15	6/30			✓	✓						4	WATER

Project Information	Sample Receipt	
Project Number: Y-304-3	Total Number of Containers	12
Project Name: Garrett's	COC Seals/Intact Y/N/NA	
Contact: Susan Gehl	Received Good Cond./Cold	
Ongoing Project? Yes ☒ No ☐	Delivery Method: Hand	
Sampler: Julie Rowland	(attached shipping bill, if any)	

Instructions

Requested Turn Around Time: RUSH - A.S.A.P.

Special Instructions: See Gene Yankie for billing instructions. Also see attached record of telecon.

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Julie Rowland Time: 1:20	Signature: Time:	Signature: Time:
Printed Name: Julie Rowland Date: 6/30	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

Gene Yankie

F-19-91/UR-r9/92

0215

ANALYTICAL RESULTS FOR SOIL SAMPLES

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.2443-1
Client Sample ID	Y-204-3 B3MWS4
Matrix	SOIL

Client Name	SHANNON & WILSON, INC.	WORK Order	78673	
Ordered By	SUSAN GUHL	Printed Date	06/08/94	@13:29 hrs.
Project Name	GARRETTS	Collected Date	05/20/94	@09:50 hrs.
Project#	Y-204-3	Received Date	05/20/94	@16:30 hrs.
PWSID	UA			
		Technical Director	STEPHEN C. EDE	
		Released By:		

Sample Remarks: SAMPLE COLLECTED BY: L. MINER. 19.8 MG/KG OF EPH PATTERN IS NOT CONSISTENT WITH MIDDLE DISTILLATE FUEL.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Percent Solids	82.3		%	SM17 2540G			05/24/94	ALN
Hydrocarbons EPH	24.0		mg/Kg	3510/3550/8100M		05/30/94	05/31/94	JBH
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	18.5		mg/Kg	EPA 5030/8015m		05/24/94	05/28/94	SPM

Benzene	0.030	U	mg/Kg	EPA 8020		05/24/94	05/28/94	SPM
Toluene	0.064		mg/Kg	EPA 8020		05/24/94	05/28/94	SPM
Ethylbenzene	0.030	U	mg/Kg	EPA 8020		05/24/94	05/28/94	SPM
m,p Xylene	0.095		mg/Kg	EPA 8020		05/24/94	05/28/94	SPM
o-Xylene	0.140		mg/Kg	EPA 8020		05/24/94	05/28/94	SPM
Sample Preparation	---			EPA 3050 Digest				
Lead	4.1		mg/Kg	EPA 7421 GF		06/01/94	06/02/94	BMW

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

5633 B Street, Anchorage, AK 99518-1600 — Tel: (907) 562-2343 Fax: (907) 561-5301

Shannon & Wilson, Inc.

Chain of Custody Record

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Page 1 of 1
Laboratory CTE
Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

94.2443

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	VOC EPA 8100	BTEX EPA 8020 / 8015	Total Lead EPA 7421					Total Number of Containers	Remarks/Matrix
(1) Y-204-3 B3MWS4		950	5/20/94			X	X	X					2	SOIL

Project Information

Project Number: Y-204-3
Project Name: Garrett's
Contact: Susan Kuhl
Ongoing Project? Yes ☒ No ☐
Sampler: L Miner

Sample Receipt

Total Number of Containers:
COC Seals/Intact Y/N/NA:
Received Good Cond./Cold:
Delivery Method:
(attached shipping bill, if any)

Instructions

Requested Turn Around Time: Standard
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Lydia Miner Time: 1636	Signature: Time:	Signature: Time:
Printed Name: Lydia Miner Date: 5/20/94	Printed Name: Date:	Printed Name: Date:
Company: S&W Inc	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Jody L Maus Time: 1636	Signature: Time:	Signature: Time:
Printed Name: JODY L. MAUS Date: 5/20/94	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

1218

APPENDIX B

TABLE OF INFLUENT AND EFFLUENT ANALYTICAL RESULTS

TABLE B-1 - WATER TREATMENT SYSTEM ANALYTICAL RESULTS

0220

Parameter	Method*	Water Sample Number (See Table 1 & Appendix A)							
		Infl-S8	Effl-S8	Infl-S9	Effl-S9	Infl-S10	Effl-S10	Infl-S11	Effl-S11
Date		4/1/94	4/1/94	4/14/94	4/14/94	5/16/94	5/16/94	5/27/94	5/27/94
Temperature - degrees C	Horiba U-10	11	12	7.5	9.6	11	10.7	11	11
pH	Horiba U-10	7.6	8.2	6.99	7	6.85	7.07	6.9	6.9
Conductivity - mmhos	Horiba U-10	0.7	0.73	0.48	0.42	0.39	0.4	0.59	0.59
Aromatic Volatile Organics									
Benzene - ppm	EPA 602	12.6	0.0038	11.500	4.470	10.3	0.427	9.28	0.536
Toluene - ppm	EPA 602	8.95	0.0041	8.750	3.380	9.65	0.391	8.1	0.459
Ethylbenzene - ppm	EPA 602	0.703	ND	0.734	0.248	0.835	ND	0.717	0.035
p & m - Xylene - ppm	EPA 602	1.75	0.0013	7.920	0.752	2.25	ND	1.89	0.094
o - Xylene - ppm	EPA 602	0.741	0.001	0.872	0.412	0.978	ND	0.817	0.043
Total BTEX - ppm	EPA 602	24.744	0.0102	29.776	9.262	24.013	0.818	20.804	1.167
Total Petroleum Hydrocarbons (TPH) - ppm	EPA 418.1	7.63	0.28	8.15	1.25	7.65	0.13	5.52	ND

Parameter	Method*	Water Sample Number (See Table 1 & Appendix A)							
		Infl-S12	Effl-S12	Infl-S13	Effl-S13	Infl-S14	Effl-S14		
Date		6/7/94	6/7/94	6/14/94	6/14/94	7/19/94	7/19/94		
Temperature - degrees C	Horiba U-10	10.5	6.7	7.4	16.2	14.2	NA		
pH	Horiba U-10	7.6	7.2	6.9	7	7.1	NA		
Conductivity - mmhos	Horiba U-10	0.407	0.524	0.396	0.32	0.69	NA		
Aromatic Volatile Organics									
Benzene - ppm	EPA 602	8.52	ND	8.870	0.058	9.93	0.0023		
Toluene - ppm	EPA 602	7.15	ND	9.260	0.055	9.66	0.0029		
Ethylbenzene - ppm	EPA 602	0.681	ND	0.933	0.004	0.975	ND		
p & m - Xylene - ppm	EPA 602	1.72	0.0013	2.820	0.019	2.57	0.0015		
o - Xylene - ppm	EPA 602	0.873	ND	1.110	0.011	1.23	0.0011		
Total BTEX - ppm	EPA 602	18.944	0.0013	22.993	0.1466	24.365	0.0078		
Total Petroleum Hydrocarbons (TPH) - ppm	EPA 418.1	5.90	ND	3.56	ND	6.25	ND		

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

9221

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Geotechnical Consultants

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

LETTER OF TRANSMITTAL

Date 10-25-94 Job No. Y-204-3

To: ADEC
800 E Dimond Blvd, Suite #3-470
Anchorage AK 99515

Attention: Robert Weimer

Re:

RECEIVED
OCT 26 1994
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

We are sending the following items:

☐ Attached ☐ Under separate cover via

☒ Report ☐ Proposal ☐ Drawings ☐ Sample ☐ Specifications

Copies	Date	No.	Description
1			3rd Quarterly Report 1994

These are transmitted:

☒ For your retention ☐ For your use ☐ As requested

☐ For review and comment ☐ For action specified below ☐ With corrections

☐ Please return by _____ ☐ Prints returned after use by us ☐ _____

Remarks:

Copies to Nelson Garrett - Garrett's Tesoro
Randy Milam ADEC By M.C.

☐ Invoice File ☐ Correspondence File

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

SEATTLE
HANFORD
FAIRBANKS
ANCHORAGE
BOSTON
SAINT LOUIS

0222

October 24, 1994

Alaska Department of Environmental Conservation
800 East Dimond Boulevard, Suite #3-470
Anchorage, Alaska 99515

Attn: Mr. Robert Weimer

RE: THIRD QUARTER 1994 MONITORING AT GARRETT'S TESORO, 724 WEST INTERNATIONAL AIRPORT ROAD, ANCHORAGE, ALASKA; SPILL #: 90-2-1-0-010-1; FILE #: L20.01

This letter report summarizes the monitoring of the soil and groundwater remediation system at Garrett's Tesoro, 724 West International Airport Road, Anchorage, Alaska, for the period of July through September, 1994. Also included are the results of the third quarter groundwater monitoring efforts conducted at the subject site. A site plan illustrating the general features at the project location is presented in Figure 1.

Soil Vapor Extraction System (VES) Monitoring

The soil Vapor Extraction System (VES) located at this site consists of two subsurface horizontal vapor recovery lines and one vertical vapor extraction well. The locations of these lines are shown in Figure 1. The VES system began continuous operation on January 5, 1994.

Monitoring of the VES included the collection of vapor analytical samples from the sampling port installed on the exhaust stack. Vapor samples were collected on a monthly basis. Prior to sampling, field measurements were conducted to ensure the vapor sample was representative of the stack exhaust. To accomplish this, a polyethylene bag was used to capture exhaust vapors from the sampling port. Temperature and flame ionization detector (FID) readings of the stack emissions were recorded at the time of collection of individual vapor samples. In addition, the velocity of air movement in the stack exhaust and the individual VES lines was measured in inches of water using pitot tubes. Once these parameters stabilized, analytical samples were collected in 1 liter stainless steel cylinders provided by the laboratory.

The monthly samples, designated VES15, VES16 and VES17, were collected on July 13, August 15, and September 7, 1994, respectively. Dates and descriptions of each VES sample collected are provided on Table 1. A summary of vapor emission concentrations measured at the exhaust stack since start-up is presented on Graph 1.

Groundwater Pump and Treat System Monitoring

The groundwater pump and treat system at this site consists of two unit operations including an oil/water separator with a batch holding tank to remove free product followed in series by a shallow-tray air stripper to reduce the dissolved phase of the hydrocarbons. Groundwater is recovered from Recovery Well RW1, shown in Figure 1, using an on-line pump and passed through a sediment filter and flow meter prior to entering the oil/water separator.

During this quarter, water samples were collected on August 5, August 15, and September 22, 1994 from both the influent and effluent sampling ports of the water treatment system. The results of these samples were used to monitor the system's aromatic volatile organics (BTEX) and

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total petroleum hydrocarbons (TPH) removal efficiency, and check for compliance with the AWWU discharge permit. Temperature, specific conductance, and pH (T-C-pH) values of the water samples were measured in the field at the time of sampling. Dates and descriptions of each water treatment sample collected are provided in Table 1. A summary of times and the T-C-pH measurements of each water treatment sample collected are provided in Table 2. A summary of contaminant concentrations measured in the influent water from Recovery Well RW1 since start-up is presented on Graph 2.

During July and August, 1994, monitoring of the groundwater treatment system took place on a weekly basis to ensure that the system was operating within the requirements of AWWU discharge Permit #32. Upon arrival at the site to collect the sample during the week of July 25, it was found that the system was malfunctioning. B.C. Excavating repaired the system and water samples Infl-S15 and Effl-S15 were collected on August 5, 1994. The test results from Effl-S15 showed that the system was again functioning correctly and was meeting the permit requirements of 0.1 ppm BTEX. The next monthly samples, Infl-S16 and Effl-S16, were collected on August 15, 1994. Samples Infl-S17 and Effl-S17 were collected on September 22, 1994.

Repairs made to the system during the months of July through September included adjusting the water treatment system's internal float system in the stripper to change the water level at which the blower for the stripper automatically turned on. Due to mist falling from the air stripper exhaust stack the groundwater pump and treat system was shut down from September 6 through September 15, 1994 and from October 16, 1994 to the present. A de-mister pad will be installed in the shallow-tray air stripper during the week of October 24, 1994 to reduce the discharge of mist and prevent the formation of ice on the ground below.

Groundwater Quality Monitoring

Samples of the groundwater pumped from Recovery Well RW1 and water samples collected from Monitoring Wells B1MW, B2MW, and B3MW, were used to evaluate the concentration of gasoline contaminants in the site's groundwater as well as the effectiveness of the remediation efforts. The locations of these wells are shown on Figure 1.

Groundwater samples from Recovery Well RW1, designated Infl-S15, Infl-S16 and Infl-S17, were collected on August 5, August 15 and September 22, 1994. One groundwater sample was collected from each of Monitoring Wells B1MW, B2MW, and B3MW, on September 29, 1994. Temperature, specific conductance, pH, and dissolved oxygen values of each water sample were measured in the field at the time of sampling. Purging, sampling and water level data as well as other measurements from the August and September sampling events are presented in Table 2. Historical summaries of contaminant concentrations measured in the influent water from Recovery Well RW1 and groundwater at the locations of Monitoring Wells B1MW, B2MW and B3MW since start-up is presented on Graphs 2 through 5, respectively.

Ambient Air Quality Monitoring

Ambient benzene standards of 0.1 ppm and 1.0 ppm for a time-weighted (TWA) 8-hour exposure have been established by NIOSH and OSHA/ACGIH, respectively. Since this site is located in a residential area, the more stringent 0.1 ppm level for NIOSH was adhered to when conducting the benzene air quality survey.

The treatment systems located at this site produce two distinct sources of benzene emissions: the VES exhaust stack and the groundwater treatment exhaust stack. During the period from April to mid-September, benzene levels in the six VES stack exhaust samples ranged from 8.2 ppm to 41.8 ppm. In addition, the volatiles removed by the water treatment air stripper were being continuously vented to the atmosphere during system operation. Based on the recovery rates established by influent and effluent testing, the listed blower capacity, and an estimated water loading rate of 5 gallons per minute, benzene emissions during the April to mid-September, 1994 period ranged from zero during periods when the treatment system was off-line to a maximum of about 2.7 ppm in April, 1994. Since these levels exceed the NIOSH and OSHA standards, and to ensure that resulting ambient benzene levels were below the standards, a monitoring program was established that consisted of direct measurements of on-site ambient benzene concentrations.

A direct measurement ambient air testing program, consisting of three sampling sessions, was implemented starting in June, 1994. The purpose of this test was to verify that the combined emissions from the VES and the shallow tray stripper do not cause ambient air concentrations to exceed the 0.1 ppm benzene NIOSH standard. The testing program was conducted over three separate four (4) day periods and consisted of placing a single 3M Model 3520 Organic Vapor Monitor Badge at each of the four sampling stations shown on Figure 1. The locations and descriptions of the vapor badge samples are summarized on Table 1.

The first sampling session was designed to measure background levels. For the first monitoring session, the VES was on and the shallow tray stripper was turned off. All VES emissions were burned by the thermal oxidizer. Vapor Badge Samples AS1-2, AS2-2, AS3-2 and AS4-2 were placed at a height within the potential breathing zone (4 to 5 feet high) on June 24 and were collected on June 28, 1994 for a total exposure time of approximately 5700 minutes.

The second ambient air test was conducted from July 19 through July 23, 1994 to measure only the emissions from the VES. During this sampling session, the VES was on, the air stripper was off, and the thermal oxidizer was temporarily shut down. All VES emissions were vented directly to the ambient air. Vapor Badge Samples AS1-3, AS2-3, AS3-3 and AS4-3 were placed at each of the identical four sampling stations as the previous test. The badges were exposed for approximately 5800 minutes. The thermal oxidizer was re-connected to the VES exhaust stack by B.C. on August 2, 1994.

A third monitoring test took place from August 15 through August 19, 1994, with the objective of monitoring the combined vapor emissions of the VES and the shallow tray air stripper. During the sampling session, the VES and air stripper were on, the thermal oxidizer was temporarily shut down and all vapors were vented directly to the ambient air. Vapor Badge Samples AS1-4, AS2-4, AS3-4 and AS4-4 were placed at each of the identical four sampling stations as the previous tests. The badges were exposed for approximately 5800 minutes. The thermal oxidizer was re-connected to the VES exhaust stack by B.C. on approximately August 24, 1994.

Laboratory Analyses

During this quarterly sampling period, a total of sixteen (16) VES stack exhaust vapor, groundwater, and ambient air samples were submitted to Commercial Testing & Engineering, Co. (CT&E) of Anchorage, for laboratory analysis. All samples were delivered to the lab in chilled coolers using Chain-of-Custody procedures. The individual laboratory reports are presented in

Appendix A.

Three (3) vapor samples from the VES discharge stack were analyzed for aromatic volatile organics (BTEX) using EPA Method 8020 and volatile petroleum hydrocarbons (VPH) using EPA Method 5030/8015. The results and historical summaries for the VES discharge stack vapor analyses are shown on Graph 1.

Three (3) influent water samples from Recovery Well RW1 and three (3) effluent water samples from the groundwater treatment system were tested for BTEX using EPA Method 602 and total petroleum hydrocarbons (TPH) using EPA Method 418.1. The results for the influent and effluent water sample analyses are summarized in Table 3. Historical summaries of the analytical results for the influent water samples are presented on Graph 2.

Three (3) groundwater samples from Monitoring Wells B1MW, B2MW and B3MW were analyzed for BTEX using EPA Method 602 and gasoline range organics (GRO) using EPA Method 5030/8015. The results and historical summaries for the monitoring well groundwater sample analyses are presented on Graphs 3, 4 and 5 and on Figure 1.

During June and July, 1994, four (4) ambient air vapor badges each month were analyzed for BTEX using EPA Method 8020 and VPH using EPA Method 5030/8015. The third and final ambient air vapor badge tests were conducted during August. The four (4) ambient air vapor badges in August were analyzed for BTEX and VPH using NIOSH Method 1501. The results of the ambient air vapor badge analyses are presented in Table 4.

Discussion of Results

Soil Vapor - As shown in Graph 1, the overall trend for VPH concentration in the stack exhaust samples shows a decrease from the previous quarter. The VPH concentrations in the individual vapor samples ranged from a maximum concentration of 467 ppm (27.9 lbs/day) in Sample VES15 to 295 ppm (18.0 lbs/day) in Sample VES17. The benzene concentrations in the individual vapor samples ranged from 8.2 ppm to 15.3 ppm for Samples VES16 and VES15, respectively.

Using the Ideal Gas Law, VPH analytical results, and the calculated air flow from the VES, the average daily rate of volatile petroleum hydrocarbon discharge for the sampling period from July 15 to September 30, 1994 (77 days) was computed to be about 22.7 pounds per day. Approximately 1748 pounds of volatile petroleum hydrocarbons were vented from the site's subsurface soil during the third quarter of VES operation. The overall trend appears to show that the volatile petroleum concentrations are decreasing over time indicating that clean up is being accomplished.

Treated Groundwater - Concentrations of total BTEX in the treatment system's influent samples, pumped from Recovery Well RW1, ranged from 21.187 ppm in Sample Infl-S16 to 21.356 ppm in Sample Infl-S17. TPH levels in the influent samples ranged from 4.09 ppm in Sample Infl-S16 to 5.85 ppm in Sample Infl-S15, with all levels being below the permit discharge limit of 10 ppm. As shown in Table 3 and on Graph 2, the total BTEX concentrations measured in the influent samples indicate that groundwater treatment is necessary to reduce hydrocarbon concentrations in the groundwater to below the levels allowed to be discharged directly to the sanitary sewer system by the AWWU permit.

During this quarter, the three effluent samples tested satisfied the permit requirements for 0.1 ppm of total BTEX. The total BTEX levels of non-detectable, 0.0063 ppm, and non-detectable contained in effluent Samples Effl-S15, Effl-S16, and Effl-S17, respectively, were within discharge permit limits. Levels of TPH in all the effluent samples were below the discharge permit limit of 10 ppm, with levels measuring 0.22 ppm, non-detectable, and non-detectable for Samples Effl-S15, Effl-S16, and Effl-S17, respectively.

Based upon the influent and effluent sample results, the groundwater treatment system's total BTEX removal efficiency was greater than 99.9% for the three sampling events during the July through September, 1994 period. As part of Permit No. 32 requirements, Mr. Ed Tatro and Mr. Peter Jeskie of AWWU were notified of the above results in required monthly reports, dated July 26, 1994, July 29, 1994, August 19, 1994, September 20, 1994, and October 13, 1994.

Ambient Air - The first ambient air sampling session, designed to measure background levels and conducted from June 24 through June 28, 1994, had results of 0.0018 ppm benzene for Sample AS1-2, 0.0038 ppm benzene for Sample AS2-2, non-detectable benzene for Sample AS3-2, and 0.0022 ppm benzene for Sample AS4-2.

The second ambient air test was conducted from July 19 through July 23, 1994 to measure only background levels and the emissions from the VES. The VES sampling session had results of 0.0064 ppm benzene for Sample AS1-3, 0.0058 ppm benzene for Sample AS2-3, 0.0037 ppm benzene for Sample AS3-3, and 0.0026 ppm benzene for Sample AS4-3.

The third ambient air sampling session was conducted from August 15 through August 19, 1994, and was designed to measure the background levels and VES and shallow tray air stripper emissions. The VES air stripper sampling session showed results of 0.0068 ppm benzene for Sample AS1-4, 0.0040 ppm benzene for Sample AS2-4, 0.0031 ppm benzene for Sample AS3-4, and 0.0035 ppm benzene for Sample AS4-4.

The three part ambient air sampling program determined that: 1) the highest background level of benzene was 0.0022 ppm; 2) the highest concentration of benzene attributable to background and the VES was 0.0064 ppm benzene; and 3) the highest concentration of benzene attributable to background, VES and shallow tray air stripper was 0.0068 ppm. The maximum concentration of benzene measured during these tests, 0.0068 ppm, is well below the NIOSH standard of 0.1 ppm.

Groundwater - Groundwater samples Infl-S15, Infl-S16 and Infl-S17, collected from Recovery Well RW1, had TPH results of 5.85 ppm, 4.09 ppm and 4.54 ppm, respectively. Samples Infl-S15, Infl-S16 and Infl-S17 had total BTEX concentrations of 20.573 ppm, 20.187 ppm and 21.356 ppm, respectively. The benzene concentrations in Samples Infl-S15, Infl-S16 and Infl-S17 were 8.77 ppm, 8.61 ppm and 9.33 ppm, respectively. As shown on Graph 2, the trend in contaminant concentrations at the location of Recovery Well RW1 have fluctuated with overall indications that the TPH and total BTEX concentrations in the groundwater are decreasing.

Samples B1MWW4, B2MWW4, and B3MWW4 were collected from Monitoring Wells B1MW, B2MW, and B3MW, respectively, on September 29, 1994 as part of the third quarterly sampling event. Sample B1MWW4 contained 76.9 ppm GRO and 43.44 ppm total BTEX with 8.32 ppm benzene, 15.5 ppm toluene, 3.86 ppm ethylbenzene, and 15.76 ppm xylenes. Sample B2MWW4 contained 144 ppm GRO and 90.88 ppm total BTEX with 44.3 ppm benzene, 31.9

ppm toluene, 3.07 ppm ethylbenzene, and 11.61 ppm xylenes. Sample B3MWW4 contained 6.11 ppm GRO and 0.596 ppm total BTEX with 0.168 ppm benzene, 0.166 ppm toluene, 0.063 ppm ethylbenzene, and 0.199 ppm xylenes. As shown in Graph 3, GRO, benzene, and total BTEX concentrations in Monitoring Well B1MW decreased from the June sampling event. In contrast, it is evident in Graph 4 that all three parameters increased in Monitoring Well B2MW since the previous event. These levels may indicate that gasoline impacted groundwater is being drawn toward Monitoring Well B2MW, which is located about 28 feet to the southwest of Recovery Well RW1. From Graph 4, it is also evident that the fluctuating groundwater levels may be influencing the contaminant concentrations at B2MW. The low levels of contaminants at the location of Monitoring Well B3MW are consistent with the historical record.

Remediation System Modifications

Based on the results of the Ambient Air Quality Monitoring, Shannon & Wilson proposed the elimination of the thermal oxidizer from the system. The highest value of benzene concentrations for combined VES and air stripper emissions since April, 1994 was calculated to be 44.49 ppm. Although, the combined emissions greatly exceed the NIOSH standard of 0.1 ppm benzene, the maximum concentration of benzene measured during the ambient air tests was only 0.0068 ppm.

To support the proposed shut down of the thermal oxidizer, the EPA approved computer model, "Screen2" was run for the data collected from the April through September, 1994 vapor emission monitoring, using exhaust stack benzene analytical results. The computer-derived value for the highest concentration of benzene in the ambient air as a result of VES operations was calculated to be 0.0086 ppm, with the most probable location for this concentration to be found at about 89 feet from the exhaust stack. Based on "Screen2" calculations, it was assumed that the NIOSH TWA benzene standard of 0.1 ppm would not be exceeded provided benzene emissions from the air stripper and the VES stack exhaust remain below 470 ppm. The "Screen2" results indicate that the thermal oxidizer could be removed from the system. This is supported by vapor badge testing in addition to the on-going measured reduced levels of benzene vapor in the VES exhaust stack.

The results of the ambient air quality monitoring were presented to Mr. Robert Weimer of ADEC-WDO on September 23, 1994. His review concluded that the thermal oxidizer was no longer needed in operation of the VES. On September 23, 1994, Mr. Robert Weimer gave permission to permanently take the thermal oxidizer off line. The thermal oxidizer was taken off line on September 30, 1994 and removed from the site by B.C. Excavating on October 20, 1994.

On-Going System Monitoring

Presently, the vapor extraction and groundwater treatment systems are functioning properly. The VES removal rate is gradually decreasing from a peak of 1980 ppm VPH on January 5, 1994, which corresponds to 393 pounds per day, to present levels of 295 ppm VPH with a calculated recovery volume of about 18 pounds per day. VES monitoring results starting from the end of January, 1994 have stayed somewhat steady, varying from a low of 8 pounds per day to a high of 43 pounds per day, not including the April measurement of 62 pounds per day. The high recovery in April was due to an intentional increase in vacuum pressure (suction) of the VES. A total of approximately 6748 pounds of VPH have been removed from the subsurface soils since January, 1994 using the VES.

The repairs to the groundwater treatment system made by B.C. Excavating have brought the effluent from the shallow tray stripper into compliance with the current AWWU discharge permit. Recent influent and effluent testing indicated that elevated hydrocarbon levels in the site's groundwater are removed by the air stripper with an efficiency of about 99%. A de-mister pad will be installed in the shallow-tray air stripper during the week of October 24, 1994 to reduce the discharge of mist and prevent the formation of ice on the ground below.

According to the requirements of the ADEC approved 1994 Workplan, Shannon & Wilson will continue to monitor the operations and effectiveness of the remediation system. We will present interim reports to ADEC following the predetermined schedule in the Workplan.

We appreciate this opportunity to be of service and your continued confidence in our firm. If you have any questions or comments concerning this submittal, please call the undersigned.

Sincerely,

SHANNON & WILSON, INC.

Prepared by:
Melisa L. Collett
Environmental Scientist

Reviewed by:
Timothy M. Terry
Vice President

Enc: Tables 1 through 4; Figure 1; Graphs 1 through 5; and Appendix A

cc: Mr. Nelson Garrett, Garrett's Tesoro
Mr. Randy Mileur, ADEC UST Financial Assistance Program

TABLE 1 - SAMPLE LOCATIONS AND DESCRIPTIONS

VAPOR SAMPLES

Sample Number	Date	Sample Location (See Figure 1)	Sample Classification
VES15	7/13/94	Emission Stack sample	Air vapor sample
VES16	8/15/94	Emission Stack sample	Air vapor sample
VES17	9/7/94	Emission Stack sample	Air vapor sample

TREATMENT SYSTEM WATER SAMPLES

Sample Number	Date	Sample Location (See Figure 1)	Sample Classification
Infl-S15	8/5/94	Groundwater Treatment System Influent	Water Sample
Effl-S15	8/5/94	Groundwater Treatment System Effluent	Water Sample
Infl-S16	8/15/94	Groundwater Treatment System Influent	Water Sample
Effl-S16	8/15/94	Groundwater Treatment System Effluent	Water Sample
Infl-S17	9/22/94	Groundwater Treatment System Influent	Water Sample
Effl-S17	9/22/94	Groundwater Treatment System Effluent	Water Sample

GROUNDWATER SAMPLES

Sample Number	Date	Sample Location (See Figure 1)	Sample Classification
B1MWW4	9/29/94	Monitoring Well B1MW, Water Sample No. 4	Groundwater
B2MWW4	9/29/94	Monitoring Well B2MW, Water Sample No. 4	Groundwater
B3MWW4	9/29/94	Monitoring Well B3MW, Water Sample No. 4	Groundwater

AMBIENT AIR SAMPLES

Sample Number	Date	Sample Location (See Figure 1)	Sample Classification
AS1-2	6/24-28/94	Air Monitoring Station #1, Sample No. 2	Vapor Badge ambient air sample
AS2-2	6/24-28/94	Air Monitoring Station #2, Sample No. 2	Vapor Badge ambient air sample
AS3-2	6/24-28/94	Air Monitoring Station #3, Sample No. 2	Vapor Badge ambient air sample
AS4-2	6/24-28/94	Air Monitoring Station #4, Sample No. 2	Vapor Badge ambient air sample
AS1-3	7/19-23/94	Air Monitoring Station #1, Sample No. 3	Vapor Badge ambient air sample
AS2-3	7/19-23/94	Air Monitoring Station #2, Sample No. 3	Vapor Badge ambient air sample
AS3-3	7/19-23/94	Air Monitoring Station #3, Sample No. 3	Vapor Badge ambient air sample
AS4-3	7/19-23/94	Air Monitoring Station #4, Sample No. 3	Vapor Badge ambient air sample
AS1-4	8/15-19/94	Air Monitoring Station #1, Sample No. 4	Vapor Badge ambient air sample
AS2-4	8/15-19/94	Air Monitoring Station #2, Sample No. 4	Vapor Badge ambient air sample
AS3-4	8/15-19/94	Air Monitoring Station #3, Sample No. 4	Vapor Badge ambient air sample
AS4-4	8/15-19/94	Air Monitoring Station #4, Sample No. 4	Vapor Badge ambient air sample

TABLE 2 - WATER SAMPLING LOG

WATER LEVEL MEASUREMENT DATA

MONITORING WELL NUMBER	B1MW	B2MW	B3MW						
DATE WATER LEVEL MEASURED	9/29/94	9/29/94	9/29/94						
TIME WATER LEVEL MEASURED	9:27	9:37	9:45						
MP ELEVATION, FT	98.20	99.07	99.40						
DEPTH TO WATER BELOW MP, FT	19.20	19.98	19.87						
WATER LEVEL ELEVATION, FT	79.00	79.09	79.53						

SAMPLING/PURGING DATA

LOCATION	B1MW	B2MW	B3MW	Infl-S15	Effl-S15	Infl-S16	Effl-S16	Infl-S17	Effl-S17
DATE SAMPLED	9/29/94	9/29/94	9/29/94	8/5/94	8/5/94	8/15/94	8/15/94	9/22/94	9/22/94
TIME SAMPLED	9:27	9:37	9:45	16:15	16:00	13:35	13:30	9:27	9:16
DEPTH TO WATER BELOW MP, FT	19.20	19.98	19.87	NA	NA	NA	NA	NA	NA
TOTAL DEPTH OF WELL BELOW MP, FT	27.00	26.15	26.50	NA	NA	NA	NA	NA	NA
WATER COLUMN IN WELL, FT	7.80	6.17	6.63	NA	NA	NA	NA	NA	NA
GALLONS PER FOOT	0.16	0.16	0.16	NA	NA	NA	NA	NA	NA
GALLONS IN WELL	1.25	0.99	1.10	NA	NA	NA	NA	NA	NA
TOTAL GALLONS PUMPED/BAILED	5.0	4.0	4.5	NA	NA	NA	NA	NA	NA
TEMPERATURE, C	5.4	5.0	5.9	10	18	12	16	6.9	14.8
SPECIFIC CONDUCTANCE, UMHOS/CM	0.87	0.99	0.373	0.75	0.66	0.74	0.69	0.687	0.626
pH	6.43	6.39	6.48	7.5	8.3	7.5	8	6.7	7.8
DISSOLVED OXYGEN, PPM	4.1	1.7	1.7	6.1	8.5	5.5	9.2	16.5	13.9
DIAMETER OF WELL CASING	2-inch	2-inch	2-inch	NA	NA	NA	NA	NA	NA
REMARKS									

Purging & Sampling Method: Voss Disposable Bailer
Sampling Personnel: Melisa Collett

KEY

MP = Measuring Point
NM = Not Measured
NA = Not Applicable

1230

TABLE 3 - WATER TREATMENT SYSTEM ANALYTICAL RESULTS

Parameter	Method*	Water Sample Number (See Table 1 & Appendix A)					
		Infl-S15	Effl-S15	Infl-S16	Effl-S16	Infl-S17	Effl-S17
Date		8/5/94	8/5/94	8/15/94	8/15/94	9/22/94	9/22/94
Temperature - degrees C	Horiba U-10	10	18	12	16	6.9	14.8
pH	Horiba U-10	7.5	8.3	7.5	8	6.7	7.8
Conductivity - mmhos	Horiba U-10	0.75	0.66	0.74	0.69	0.687	0.626
Aromatic Volatile Organics							
Benzene - ppm	EPA 602	8.77	ND	8.610	ND	9.33	ND
Toluene - ppm	EPA 602	8.08	ND	7.600	0.003	8.32	ND
Ethylbenzene - ppm	EPA 602	0.767	ND	0.787	ND	0.765	ND
p & m - Xylene - ppm	EPA 602	2.02	ND	2.070	0.002	2.00	ND
o - Xylene - ppm	EPA 602	0.936	ND	1.120	0.002	0.941	ND
Total BTEX - ppm	EPA 602	20.573	ND	20.187	0.0063	21.356	ND
Total Petroleum Hydrocarbons (TPH) - ppm	EPA 418.1	5.85	0.22	4.09	ND	4.54	ND

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

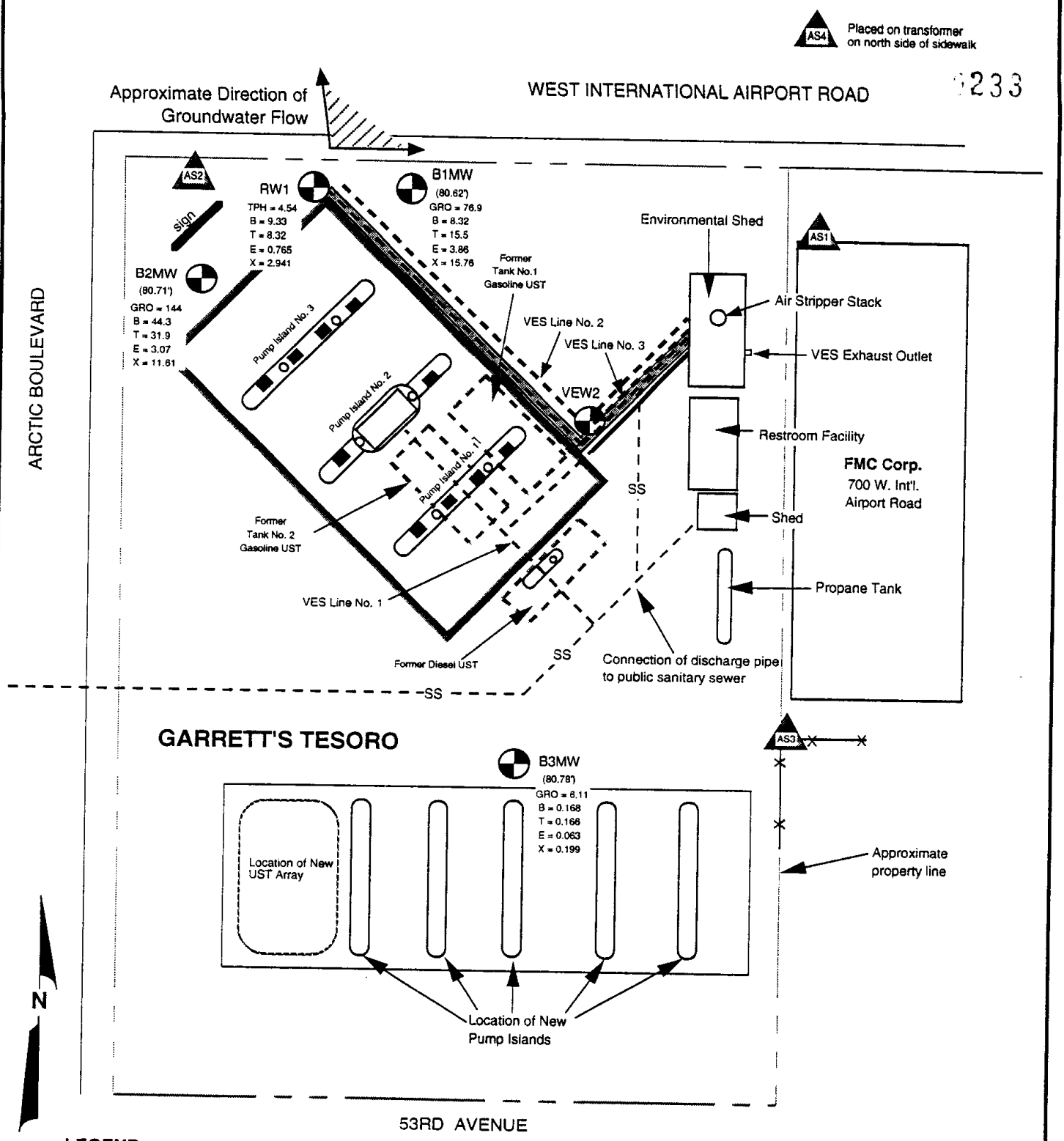
TABLE 4 - AMBIENT AIR ANALYTICAL RESULTS

Parameter	Method*	Ambient Air Vapor Badge Sample Number (See Table 1 & Appendix A)			
		AS1-2	AS2-2	AS3-2	AS4-2
Volatile Petroleum Hydrocarbons (VPH) - ppm	EPA 5030/8015	0.0084	0.0147	0.0068	0.0100
Aromatic Volatile Organics (BTEX)	EPA 8020				
Benzene - ppm	EPA 8020	0.0018	0.0038	ND	0.0022
Toluene - ppm	EPA 8020	0.0047	0.0080	0.0036	0.0056
Ethylbenzene - ppm	EPA 8020	ND	ND	ND	ND
p & m - Xylene - ppm	EPA 8020	0.0023	0.0036	0.0017	0.0026
o - Xylene - ppm	EPA 8020	ND	0.0013	ND	ND
Total BTEX - ppm	EPA 8020	0.0088	0.0167	0.0053	0.0104

Parameter	Method*	Ambient Air Vapor Badge Sample Number (See Table 1 & Appendix A)			
		AS1-3	AS2-3	AS3-3	AS4-3
Volatile Petroleum Hydrocarbons (VPH) - ppm	EPA 5030/8015	0.0985	0.0295	0.0394	0.0257
Aromatic Volatile Organics (BTEX)	EPA 8020				
Benzene - ppm	EPA 8020	0.0064	0.0058	0.0037	0.0026
Toluene - ppm	EPA 8020	0.0275	0.0111	0.0092	0.0063
Ethylbenzene - ppm	EPA 8020	0.0018	0.0015	ND	ND
p & m - Xylene - ppm	EPA 8020	0.0900	0.0050	0.0044	0.0031
o - Xylene - ppm	EPA 8020	0.0032	0.0018	0.0017	0.0013
Total BTEX - ppm	EPA 8020	0.1289	0.0252	0.0190	0.0133

Parameter	Method*	Ambient Air Vapor Badge Sample Number (See Table 1 & Appendix A)			
		AS1-4	AS2-4	AS3-4	AS4-4
Volatile Petroleum Hydrocarbons (VPH) - ppm	NIOSH 1501	0.06	0.0294	0.0329	0.0175
Aromatic Volatile Organics (BTEX)	NIOSH 1501				
Benzene - ppm	NIOSH 1501	0.0068	0.0040	0.0031	0.0035
Toluene - ppm	NIOSH 1501	0.0140	0.0094	0.0078	0.0090
Ethylbenzene - ppm	NIOSH 1501	0.0016	0.0014	ND	0.0013
p & m - Xylene - ppm	NIOSH 1501	0.0076	0.0045	0.0038	0.0045
o - Xylene - ppm	NIOSH 1501	0.0029	0.0017	0.0014	0.0016
Total BTEX - ppm	NIOSH 1501	0.0329	0.0210	0.0161	0.0199

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



Note: Thermal oxydizer taken off-line on 9/30/94 and removed from site on October 20, 1994

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SITE PLAN

October 1994 Y-204-3

SHANNON & WILSON, INC.
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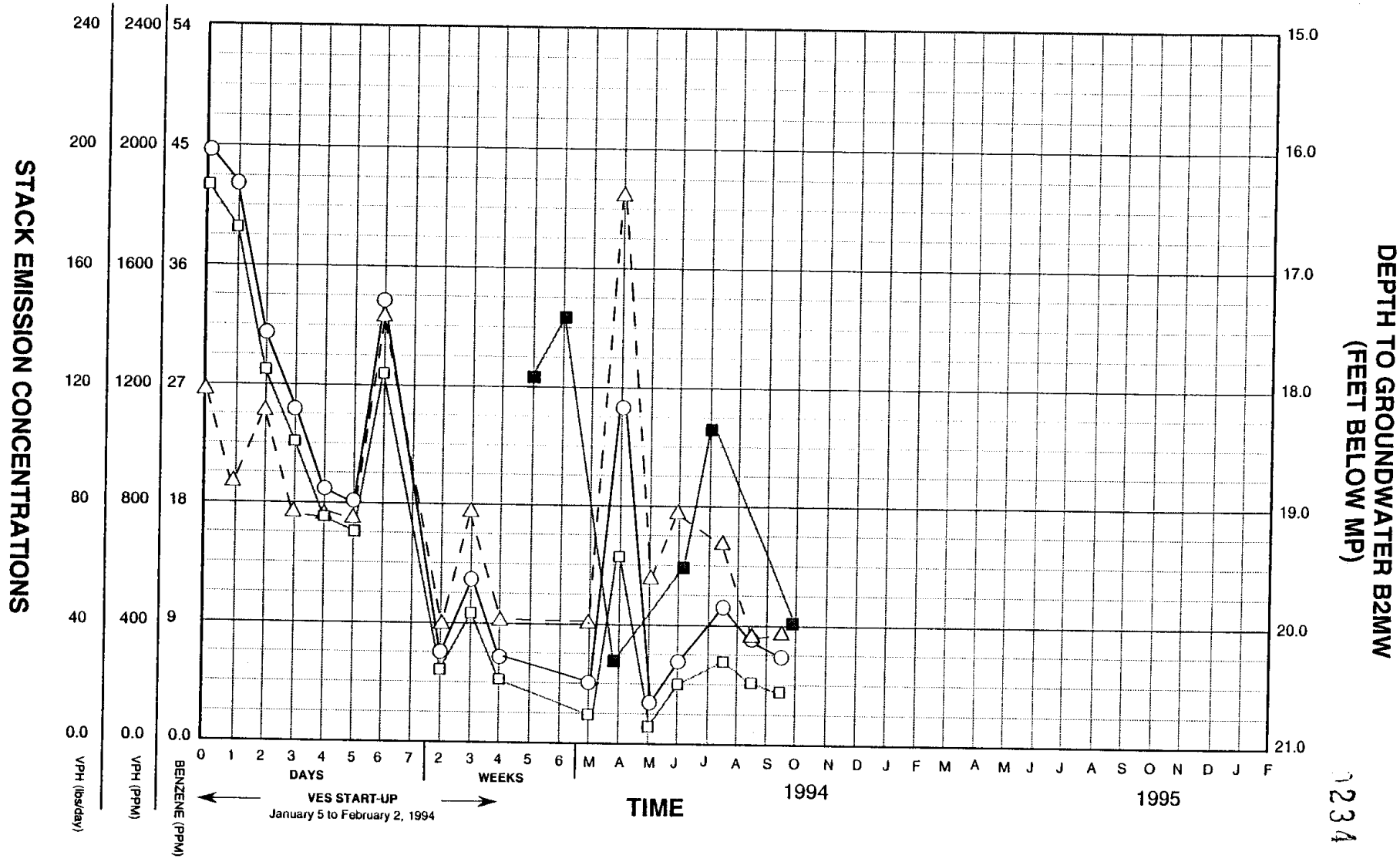
Fig. 1



SAMPLE NUMBER	DATE	DEPTH TO GROUNDWATER ■ (FT.)	VPH (lbs/day) □	CONCENTRATION (PPM)	
				○ VPH	△ BENZENE
VES 15	7/13/94	18.4	27.9	467	15.3
VES 16	8/15/94	18.4	22.2	363	8.2
VES 17	9/7/94	18.4	18.0	295	8.42

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VAPOR CONCENTRATION VS. TIME TRENDS

October 1994 Y-204-3

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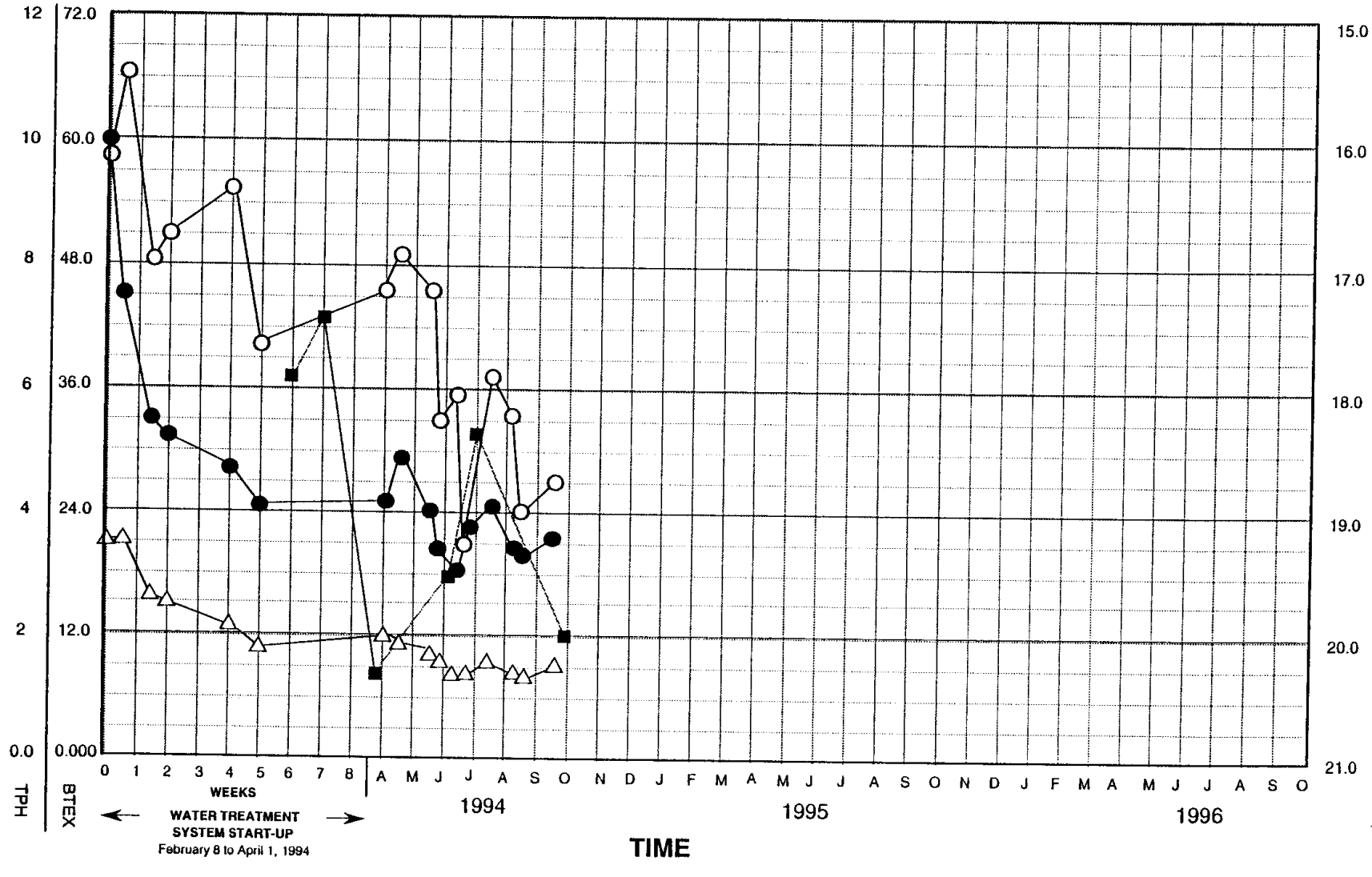
Graph 1

1234



SAMPLE NUMBER	DATE	DEPTH TO GROUNDWATER ■ (FT.)	CONCENTRATION (PPM)		
			○ TPH	△ BENZENE	● TOTAL BTEX
Infl-S15	8/5/94	18.4	5.85	8.77	20.573
Infl-S16	8/15/94	18.4	4.09	8.61	20.187
Infl-S17	9/22/94	18.4	4.54	9.33	21.356

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RECOVERY WELL RW1
INFLUENT TRENDS

October 1994 Y-204-3

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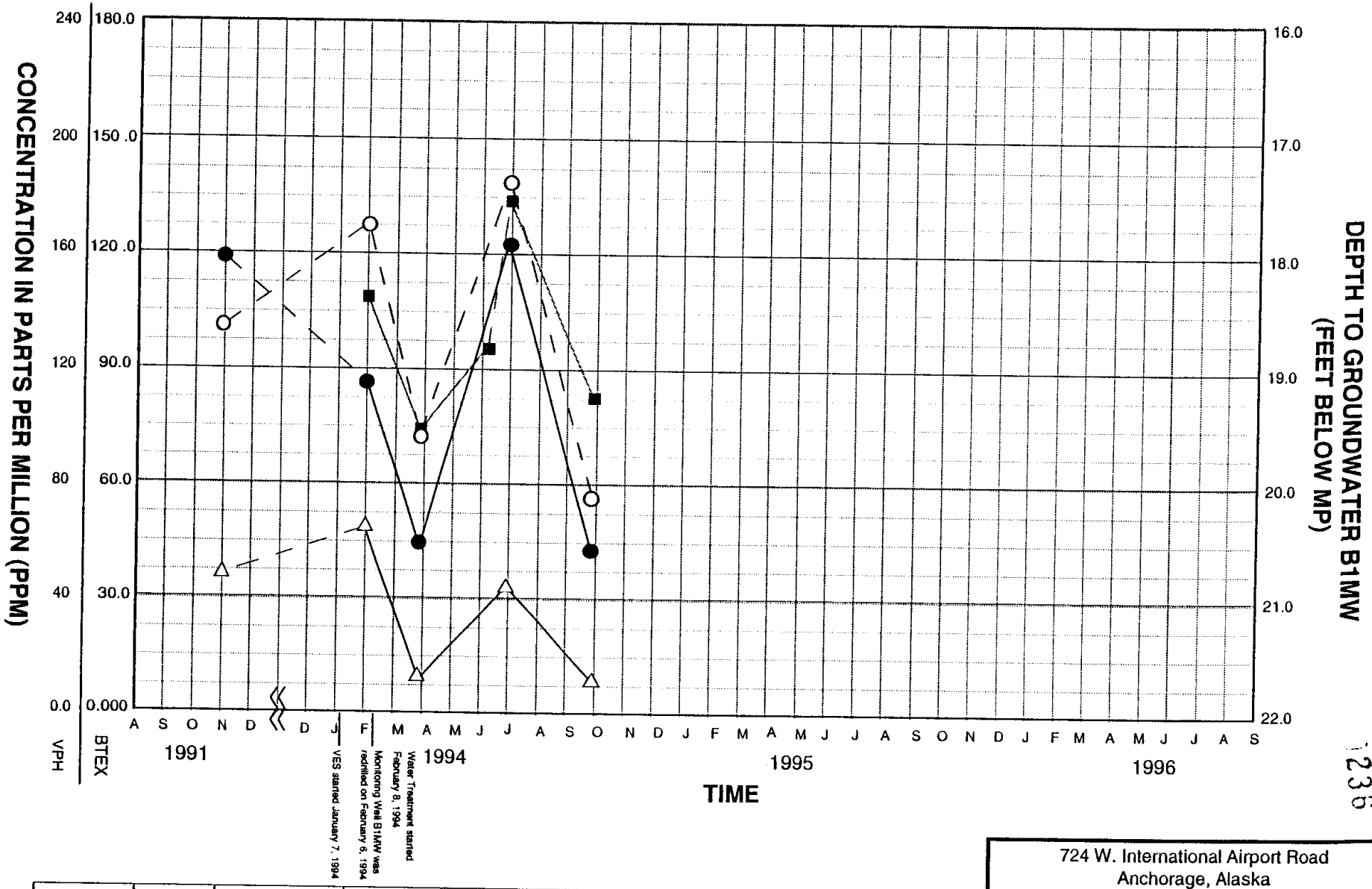
Graph 2

1235



1236

SAMPLE NUMBER	DATE	DEPTH TO GROUNDWATER ■ (FT.)	CONCENTRATION (PPM)		
			△ BENZENE	● TOTAL BTEX	○ VPH
B1MWW4	9/29/94	19.20	8.32	43.44	76.9

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MONITORING WELL B1MW TRENDS

October 1994 Y-204-3

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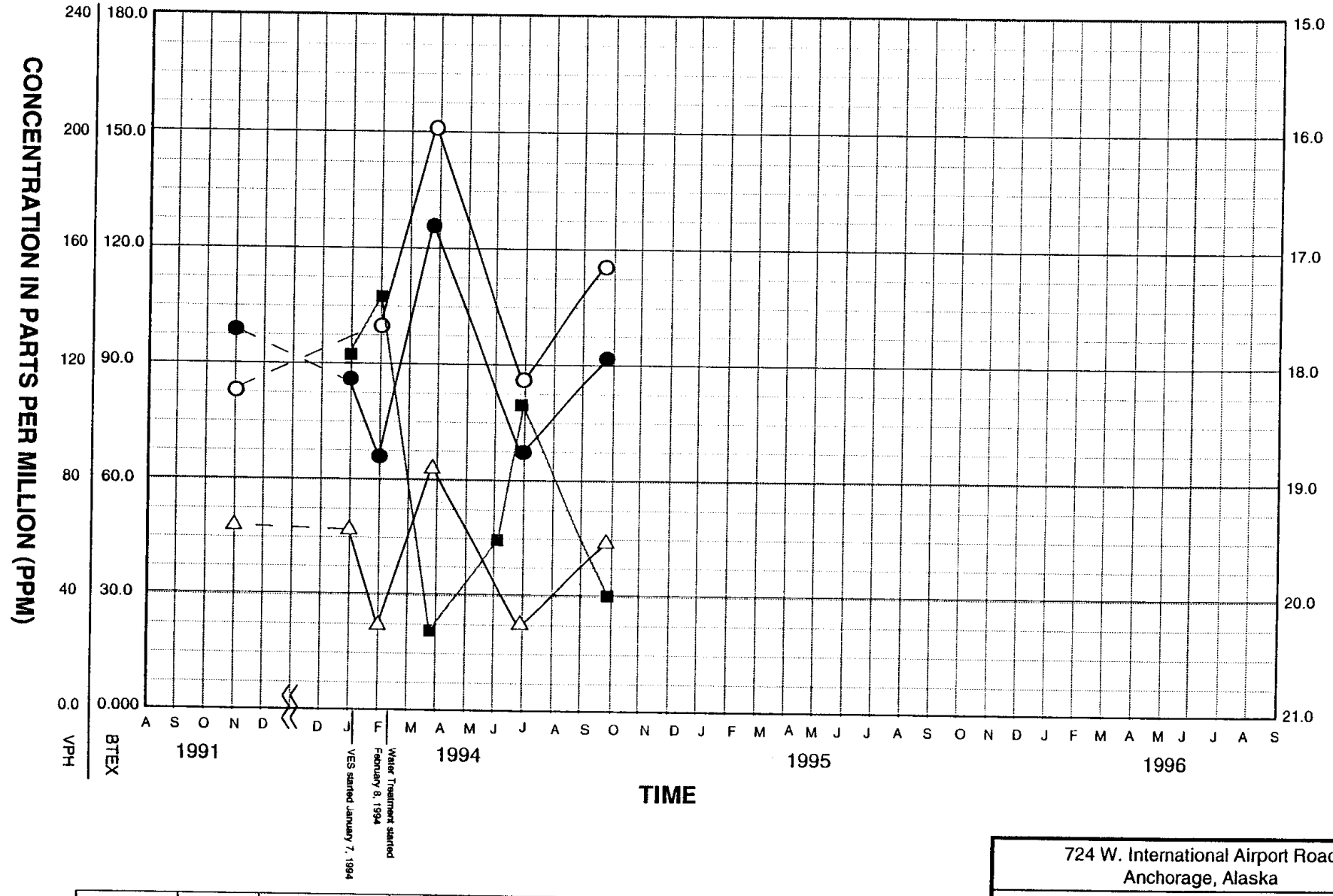
Graph 3



SAMPLE NUMBER	DATE	DEPTH TO GROUNDWATER ■ (FT.)	CONCENTRATION (PPM)		
			△ BENZENE	● TOTAL BTEX	○ VPH
B2MWW4	9/29/94	19.98	44.3	90.88	144

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MONITORING WELL B2MW TRENDS

October 1994 Y-204-3

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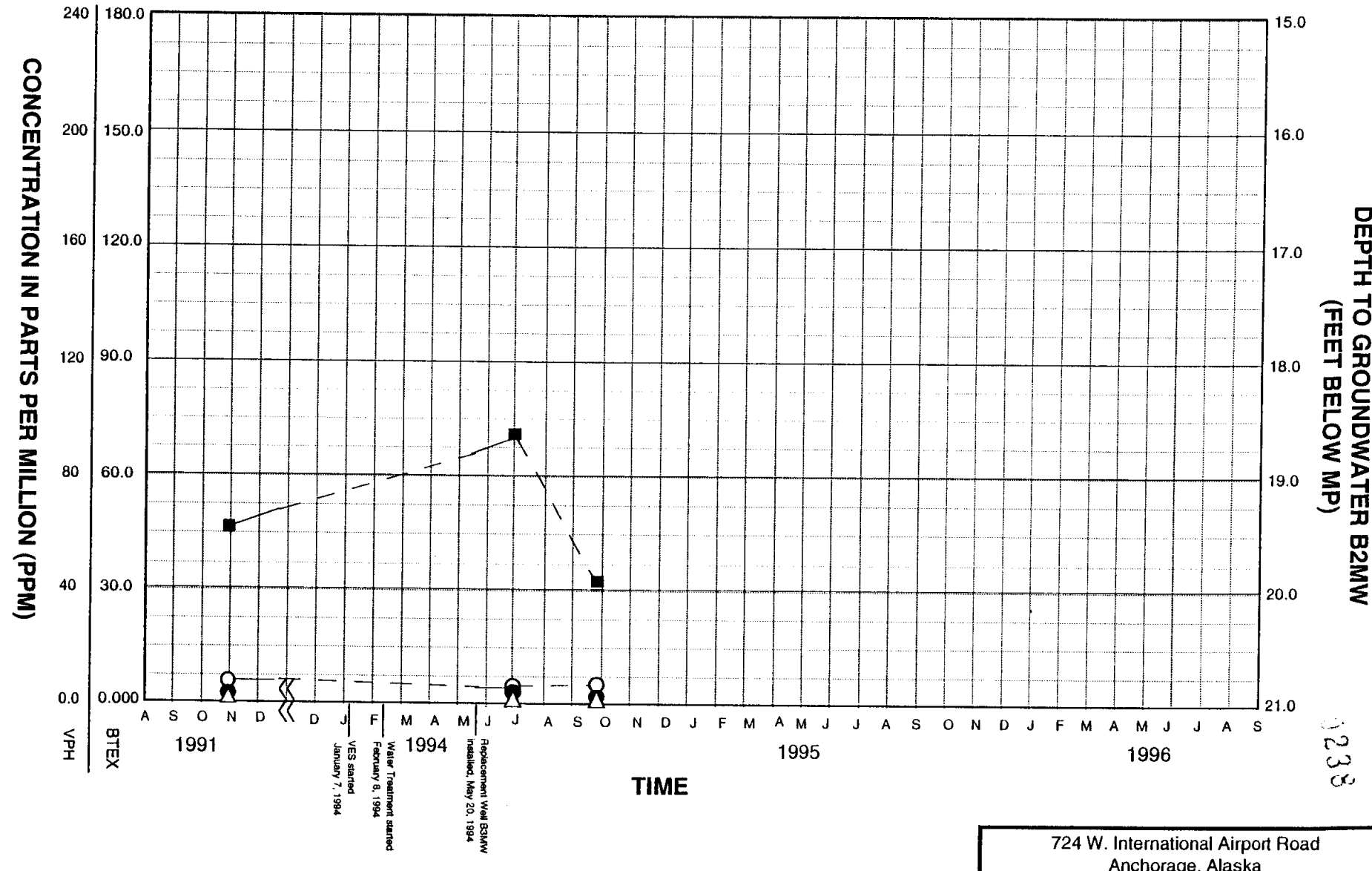
Graph 4

237



SAMPLE NUMBER	DATE	DEPTH TO GROUNDWATER ■ (FT.)	CONCENTRATION (PPM)		
			△ BENZENE	● TOTAL BTEX	○ VPH
B3MWW4	9/29/94	19.87	0.168	0.596	6.11

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MONITORING WELL B3MW TRENDS

October 1994 Y-204-3

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Graph 5

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APPENDIX A

RESULTS OF ANALYTICAL TESTING BY COMMERCIAL TESTING & ENGINEERING CO., ANCHORAGE, ALASKA

RESULTS FOR VAPOR EMISSIONS SAMPLES

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3516-1
Client Sample ID	Y-204-3-VES15
Matrix	GAS

1241

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y-204-3
PWSID	UA

WORK Order	80339		
Printed Date	07/22/94	@ 16:14	hrs.
Collected Date	07/13/94	@ 10:07	hrs.
Received Date	07/13/94	@ 11:30	hrs.

Technical Director STEPHEN C. EDE

Released By: Shawn Parker

Sample Remarks: SAMPLE COLLECTED BY: JIM ZSCHAN.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	467	D	ppm	EPA 5030/8015m			07/20/94	MDU

Benzene	15.3	D	ppm	EPA 8020			07/20/94	MDU
Toluene	26.3	D	ppm	EPA 8020			07/20/94	MDU
Ethylbenzene	1.92		ppm	EPA 8020			07/20/94	MDU
p&m Xylene	8.53		ppm	EPA 8020			07/20/94	MDU
o-Xylene	2.92		ppm	EPA 8020			07/20/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

5633 B Street, **Anchorage, AK 99518-1600** — Tel: (907) 562-2343 Fax: (907) 561-5301

94.3516

Shannon & Wilson, Inc.

Chain of Custody Record

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Seattle, WA 98103
(206) 632-8020

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St. Louis, MO 63141
(314) 872-8170

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Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Page 1 of ____
Laboratory CT&E
Attn: ____

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 8015 GRO	EPA 8020 BTEX						Total Number of Containers	Remarks/Matrix
(1) Y-204-3-VES15		10:07	7/13/94		X	1	1						1	Vapor Canister

Project Information	
Project Number: Y-204-3	
Project Name: Garretts	
Contact: Susan Guhl	
Ongoing Project? Yes ☒ No ☐	
Sampler: Jim Zschau	

Sample Receipt	
Total Number of Containers	1
COC Seals/Intact Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attached shipping bill, if any)	

Instructions

Requested Turn Around Time: Regular

Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: James A Zschau Time: 1130	Signature: Time:	Signature: Time:
Printed Name: James A Zschau Date: 7-13-94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Laura Hopkins Time: 1130	Signature: Time:	Signature: Time:
Printed Name: Laura Hopkins Date: 7/13/94	Printed Name: Date:	Printed Name: Date:
Company: C.T.&E.	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

1242

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LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.4169-3
Client Sample ID	Y-204-3-VES16
Matrix	GAS
Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y-204-3
PWSID	UA

WORK Order	81386		
Printed Date	09/02/94	@ 16:06	hrs.
Collected Date	08/15/94	@	hrs.
Received Date	08/15/94	@ 15:10	hrs.

Technical Director STEPHEN C. EDE

Released By: Shannon Preston

Sample Remarks: SAMPLE COLLECTED BY: M. COLLETT.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX Air				NIOSH 1501	n/a			
Volatile Hydrocarbons	363	D	ppm	NIOSH 1501			08/24/94	MDU
Benzene	8.2	D	ppm	NIOSH 1501			08/24/94	MDU
Toluene	13.4	D	ppm	NIOSH 1501			08/24/94	MDU
Ethyl Benzene	0.702		ppm	NIOSH 1501			08/24/94	MDU
p- & m Xylene	3.959		ppm	NIOSH 1501			08/24/94	MDU
o- Xylene	1.495		ppm	NIOSH 1501			08/24/94	MDU

See Special Instructions Above
See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

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LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.4169-3
Client Sample ID	Y-204-3-VES16
Matrix	GAS
Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y-204-3
PWSID	UA

WORK Order	81386		
Printed Date	09/02/94	@16:06	hrs.
Collected Date	08/15/94	@	hrs.
Received Date	08/15/94	@15:10	hrs.
Technical Director	STEPHEN C. EDE		

Released By: Shannon Preston

Sample Remarks: SAMPLE COLLECTED BY: M. COLLETT.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
TPH & BTEX Air				NIOSH 1501	n/a			
Volatile Hydrocarbons	363	D	ppm	NIOSH 1501			08/24/94	MDU
Benzene	8.2	D	ppm	NIOSH 1501			08/24/94	MDU
Toluene	13.4	D	ppm	NIOSH 1501			08/24/94	MDU
Ethyl Benzene	0.702		ppm	NIOSH 1501			08/24/94	MDU
m,p-Xylene	3.959		ppm	NIOSH 1501			08/24/94	MDU
o-Xylene	1.495		ppm	NIOSH 1501			08/24/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

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Chain of Custody Record

Page 1 of 1
Laboratory [illegible]
Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

94.4169

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab								Total Number of Containers	Remarks/Matrix
(1) Y-204-3-[illegible]						X	X						1	
(2) Y-204-3-[illegible]						X	X						1	
(3) Y-204-3-VES[illegible]								X	X				1	

Project Information	Sample Receipt
Project Number: Y 204 3	Total Number of Containers
Project Name:	COC Seals/Intact Y/N/NA
Contact:	Received Good Cond./Cold
Ongoing Project? Yes ☒ No ☐	Delivery Method:
Sampler: M. Collett	(attached shipping bill, if any)

Instructions
Requested Turn Around Time: Regular
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

1245

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.4578-1
Client Sample ID	Y204-3-VES17 VAPOR CANISTER
Matrix	GAS

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y204-3
PWSID	UA

WORK Order	82002		
Printed Date	09/19/94	@ 10:46	hrs.
Collected Date	09/07/94	@ 16:15	hrs.
Received Date	09/07/94	@ 16:17	hrs.

Technical Director STEPHEN C. EDE

Released By: Stephen Ede

Sample Remarks: SAMPLE COLLECTED BY: MELISA COLLETT.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	295	D	ppm	EPA 5030/8015m			09/15/94	MTT

Benzene	8.42	D	ppm	EPA 8020			09/15/94	MTT
Toluene	15.5	D	ppm	EPA 8020			09/15/94	MTT
Ethylbenzene	1.55	D	ppm	EPA 8020			09/15/94	MTT
p&m Xylene	6.51	D	ppm	EPA 8020			09/15/94	MTT
o-Xylene	3.02	D	ppm	EPA 8020			09/15/94	MTT

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

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Page 1 of 1

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Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

94.4578

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 8015 GRO	EPA 8020 BTEX						Total Number of Containers	Remarks/Matrix
Y204-3-VES17		16:15	9-7-94			X	X						1	vapor canister

Project Information

Project Number: Y204-3
Project Name: Garrett's
Contact: Susan Guhl
Ongoing Project? Yes [X] No [ ]
Sampler: Melisa Collett

Sample Receipt

Total Number of Containers: 1
COC Seals/Intact Y/N/NA:
Received Good Cond./Cold:
Delivery Method:
(attached shipping bill, if any)

Instructions

Requested Turn Around Time: Regular
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Melisa L. Collett Time: 16:17	Signature: Time:	Signature: Time:
Printed Name: Melisa L. Collett Date: 9-7-94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 16:17	Signature: Time:	Signature: Time:
Printed Name: Laura Hoskins Date: 9/7/94	Printed Name: Date:	Printed Name: Date:
Company: C.T.E.	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

0247

RESULTS FOR WATER TREATMENT SYSTEM INFLUENT AND EFFLUENT WATER SAMPLES

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3997-1
Client Sample ID	Y-204-3-INFL-S15
Matrix	WATER

Client Name	SHANNON & WILSON, INC.	WORK Order	81088	
Ordered By	SUSAN GUHL	Printed Date	08/15/94	@ 14:11 hrs.
Project Name	GARRETT'S	Collected Date	08/05/94	@ 16:15 hrs.
Project#	Y-204-3	Received Date	08/05/94	@ 16:45 hrs.
PWSID	UA	Technical Director	STEPHEN C. EDE	

Released By: Shannon Pratson

Sample Remarks: SAMPLE COLLECTED BY: MLC. SAMPLE ALSO CONTAINS AN ESTIMATED 0.221 MG/L OF 1,2-DICHLORETHANE.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	5.85		mg/L	EPA 418.1		08/12/94	08/12/94	JS
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	8.77	D	mg/L	EPA 602 18AAC78		08/13/94	08/13/94	MLB
Toluene	8.08	D	mg/L	EPA 602 18AAC78		08/13/94	08/13/94	MLB
Ethylbenzene	0.767	D	mg/L	EPA 602 18AAC78		08/13/94	08/13/94	MLB
m&m Xylene	2.02	D	mg/L	EPA 602 18AAC78		08/13/94	08/13/94	MLB
o-Xylene	0.936	D	mg/L	EPA 602 18AAC78		08/13/94	08/13/94	MLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

SINCE 1908

Commercial Testing & Engineering Co.

Environmental Laboratory Services

3250

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3997-2
Client Sample ID	Y-204-3-EFFL-S15
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y-204-3
PWSID	UA

WORK Order	81088		
Printed Date	08/15/94	@ 14:11	hrs.
Collected Date	08/05/94	@ 16:00	hrs.
Received Date	08/05/94	@ 16:45	hrs.

Technical Director STEPHEN C. EDE

Released By: [signature]

Sample Remarks: SAMPLE COLLECTED BY: MLC.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	0.22		mg/L	EPA 418.1		08/12/94	08/12/94	JS
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	0.0010	U	mg/L	EPA 602 18AAC78		08/13/94	08/13/94	MLB
Toluene	0.0010	U	mg/L	EPA 602 18AAC78		08/13/94	08/13/94	MLB
Ethylbenzene	0.0010	U	mg/L	EPA 602 18AAC78		08/13/94	08/13/94	MLB
p&m Xylene	0.0010	U	mg/L	EPA 602 18AAC78		08/13/94	08/13/94	MLB
o-Xylene	0.0010	U	mg/L	EPA 602 18AAC78		08/13/94	08/13/94	MLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

Chain of Custody Record

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Page 1 of 1
Laboratory CT&E
Attn: _____

94.3997

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	TPH EPA 418.1	BTEX EPA 602	Total Number of Containers	Remarks/Matrix
1	Y-204-3-DF1-S15	16'15	~~16'00~~	8-5-94			X	X	~~3~~ 4	water
2	Y-204-3-~~EF~~F1-S15		16'00	8-5-94			X	X	4	↓

Project Information	
Project Number: Y-204-3	
Project Name: Garrett's	
Contact: Susan Guhl	
Ongoing Project? Yes ☒ No ☐	
Sampler: MLC	

Sample Receipt	
Total Number of Containers	
COC Seals/Intact Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attached shipping bill, if any)	

Instructions

Requested Turn Around Time: Regular

Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Melissa L. Collett Time: 4:45	Signature: Time:	Signature: Time:
Printed Name: Melissa L. Collett Date: 8-5-94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Jody L. Maus Time: 1645	Signature: Time:	Signature: Time:
Printed Name: Jody L. Maus Date: 8/5/94	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

Environmental Laboratory Services

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Commercial Testing & Engineering Co.

Environmental Laboratory Services

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LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.4169-1
Client Sample ID	Y-204-3-INFL-S16
Matrix	WATER

252

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y-204-3
PWSID	UA

WORK Order	81386		
Printed Date	09/02/94	@ 16:06	hrs.
Collected Date	08/15/94	@	hrs.
Received Date	08/15/94	@ 15:10	hrs.

Technical Director STEPHEN C. EDE

Released By: Shannon Pieton

Sample Remarks: SAMPLE COLLECTED BY: M. COLLETT.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	4.09		mg/L	EPA 418.1		08/19/94	08/19/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	8.61	D	mg/L	EPA 602 18AAC78		08/29/94	08/29/94	MLB
Toluene	7.60	D	mg/L	EPA 602 18AAC78		08/29/94	08/29/94	MLB
Ethylbenzene	0.787	D	mg/L	EPA 602 18AAC78		08/29/94	08/29/94	MLB
p&m Xylene	2.07	D	mg/L	EPA 602 18AAC78		08/29/94	08/29/94	MLB
o-Xylene	1.12	D	mg/L	EPA 602 18AAC78		08/29/94	08/29/94	MLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

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LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

0253

CT&E Ref.#	94.4169-2
Client Sample ID	Y-204-3-EFFL-S16
Matrix	WATER

Client Name	SHANNON & WILSON, INC.	WORK Order	81386	
Ordered By	SUSAN GUHL	Printed Date	09/02/94	@ 16:06 hrs.
Project Name	GARRETTS	Collected Date	08/15/94	@ hrs.
Project#	Y-204-3	Received Date	08/15/94	@ 15:10 hrs.
PWSID	UA	Technical Director	STEPHEN C. EDE	

Released By:

Sample Remarks: SAMPLE COLLECTED BY: M. COLLETT.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	0.20	U	mg/L	EPA 418.1		08/19/94	08/19/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	0.0021	U	mg/L	EPA 602 18AAC78		08/27/94	08/27/94	MLB
Toluene	0.0030		mg/L	EPA 602 18AAC78		08/27/94	08/27/94	MLB
Ethylbenzene	0.0010	U	mg/L	EPA 602 18AAC78		08/27/94	08/27/94	MLB
p&m Xylene	0.0018		mg/L	EPA 602 18AAC78		08/27/94	08/27/94	MLB
o-Xylene	0.0015		mg/L	EPA 602 18AAC78		08/27/94	08/27/94	MLB

* See Special Instructions Above
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Commercial Testing & Engineering Co.

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Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

1254

CT&E Ref.#	94.4169-3
Client Sample ID	Y-204-3-VES16
Matrix	GAS

Client Name	SHANNON & WILSON, INC.	WORK Order	81386	
Ordered By	SUSAN GUHL	Printed Date	09/02/94	@ 16:06 hrs.
Project Name	GARRETT'S	Collected Date	08/15/94	@ hrs.
Project#	Y-204-3	Received Date	08/15/94	@ 15:10 hrs.
PWSID	UA			

Technical Director STEPHEN C. EDE

Released By: Shannon Preston

Sample Remarks: SAMPLE COLLECTED BY: M. COLLETT.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
TPH & BTEX Air				NIOSH 1501	n/a			
Volatile Hydrocarbons	363	D	ppm	NIOSH 1501			08/24/94	MDU
Benzene	8.2	D	ppm	NIOSH 1501			08/24/94	MDU
Toluene	13.4	D	ppm	NIOSH 1501			08/24/94	MDU
Ethyl Benzene	0.702		ppm	NIOSH 1501			08/24/94	MDU
m,p Xylene	3.959		ppm	NIOSH 1501			08/24/94	MDU
o-Xylene	1.495		ppm	NIOSH 1501			08/24/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
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LT = Less Than
GT = Greater Than

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Chain of Custody Record

Page 1 of 1
Laboratory CT&E
Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

94.4169

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	TPH EPA 418.1	BTEX EPA 602	GRO EPA 8015	BTEX EPA 8020				Total Number of Containers	Remarks/Matrix
1	Y-204-3-Infl-S16			8/15/94			X	X						4	H_2O
2	Y-204-3-Effl-S16			8/15/94			X	X						4	H_2O
3	Y-204-3-VES16			8/15/94					X	X				1	vapor

Project Information

Project Number: Y-204-3
Project Name: Garrett's
Contact: Susan Guhl
Ongoing Project? Yes ☒ No ☐
Sampler: M. Collett

Sample Receipt

Total Number of Containers:
COC Seals/Intact Y/N/NA:
Received Good Cond./Cold:
Delivery Method:
(attached shipping bill, if any)

Instructions

Requested Turn Around Time: Regular
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Melissa L. Collett Time: 1510	Signature: Time:	Signature: Time:
Printed Name: Melissa L. Collett Date: 8/15/94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:
Received By: 1.	**Received By: 2.**	**Received By: 3.**
Signature: Jody L. Mais Time: 1510	Signature: Time:	Signature: Time:
Printed Name: JODY L. MAIS Date: 8/15/94	Printed Name: Date:	Printed Name: Date:
Company: CT+E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-9/92

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Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.4879-1
Client Sample ID	Y204-3 INFL-S17
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y204-3
PWSID	UA

WORK Order	82463		
Printed Date	10/07/94	@21:18	hrs.
Collected Date	09/22/94	@09:27	hrs.
Received Date	09/22/94	@09:45	hrs.

Technical Director: STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: MELISA COLLETT.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	4.54		mg/L	EPA 418.1		09/28/94	09/28/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	9.33	D	mg/L	EPA 602 18AAC78		09/28/94	09/28/94	JLB
Toluene	8.32	D	mg/L	EPA 602 18AAC78		09/28/94	09/28/94	JLB
Ethylbenzene	0.765	D	mg/L	EPA 602 18AAC78		09/28/94	09/28/94	JLB
p&m Xylene	2.00	D	mg/L	EPA 602 18AAC78		09/28/94	09/28/94	JLB
o-Xylene	0.941	D	mg/L	EPA 602 18AAC78		09/28/94	09/28/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.4879-2
Client Sample ID	Y204-3 EFFL S17
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETTS
Project#	Y204-3
PWSID	UA

WORK Order	82463		
Printed Date	10/10/94	@15:30	hrs.
Collected Date	09/22/94	@09:16	hrs.
Received Date	09/22/94	@09:45	hrs.

Technical Director STEPHEN C. EDE

Released By: Stephen C. Ede

Sample Remarks: SAMPLE COLLECTED BY: MELISA COLLETT.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
Petroleum Hydrocarbons	0.20	U	mg/L	EPA 418.1		09/29/94	09/29/94	SMK
Aromatics-BTEX				EPA 602 18AAC78	n/a			
Benzene	0.0010	U	mg/L	EPA 602 18AAC78		09/28/94	09/28/94	JLB
Toluene	0.0010	U	mg/L	EPA 602 18AAC78		09/28/94	09/28/94	JLB
Ethylbenzene	0.0010	U	mg/L	EPA 602 18AAC78		09/28/94	09/28/94	JLB
p&m Xylene	0.0010	U	mg/L	EPA 602 18AAC78		09/28/94	09/28/94	JLB
o-Xylene	0.0010	U	mg/L	EPA 602 18AAC78		09/28/94	09/28/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

Chain of Custody Record

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Page 1 of 1

Laboratory CT&E

Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	TPH EPA 418.1	BTEX EPA 602						Total Number of Containers	Remarks/Matrix
(1)	Y204-3 ~~Infl~~-S17		9-22-94	9:27											H_2O
(2)	Y204-3 ~~Effl~~ Eff S17		"	9:16											"
															94.4879

Project Information	
Project Number: Y204-3	
Project Name: Garrett's	
Contact: Susan Guhl	
Ongoing Project? Yes ☒ No ☐	
Sampler: Melisa Collett	

Sample Receipt	
Total Number of Containers	
COC Seals/Intact Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attached shipping bill, if any)	

Instructions
Requested Turn Around Time: Regular
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Melisa J. Collett Time: 9-22-94	Signature: Time:	Signature: Time:
Printed Name: Melisa L. Collett Date: 9-45	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 9/22/94	Signature: Time:	Signature: Time:
Printed Name: Jody L. Mau Date: 0945	Printed Name: Date:	Printed Name: Date:
Company: CT&E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

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RESULTS FOR GROUNDWATER MONITORING WELL SAMPLES

Commercial Testing & Engineering Co.

SINCE 1909

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.4989-1
Client Sample ID	Y204-3-B1MWW4
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y204-3
PWSID	UA

WORK Order	82613		
Printed Date	10/11/94	@16:06	hrs.
Collected Date	09/29/94	@11:05	hrs.
Received Date	09/29/94	@11:55	hrs.

Technical Director STEPHEN C. EDE

Released By: Shannon Parker

Sample Remarks: SAMPLE COLLECTED BY: M.C.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				5030/8015M/602				
Hydrocarbons VPH	76.9	D	mg/L	EPA 5030/8015m		10/05/94	10/05/94	SPM

Benzene	8.32	D	mg/L	EPA 602		10/05/94	10/05/94	SPM
Toluene	15.5	D	mg/L	EPA 602		10/05/94	10/05/94	SPM
Ethylbenzene	3.86	D	mg/L	EPA 602		10/05/94	10/05/94	SPM
p & m Xylene	12.6	D	mg/L	EPA 602		10/05/94	10/05/94	SPM
o-Xylene	3.16	D	mg/L	EPA 602		10/05/94	10/05/94	SPM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.4989-2
Client Sample ID	Y204-3-B2MWW4
Matrix	WATER
Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y204-3
PWSID	UA

WORK Order	82613		
Printed Date	10/11/94	@16:06	hrs.
Collected Date	09/29/94	@11:11	hrs.
Received Date	09/29/94	@11:55	hrs.

Technical Director STEPHEN C. EDE

Released By: Shannon Patton

Sample Remarks: SAMPLE COLLECTED BY: M.C.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX				5030/8015M/602				
Hydrocarbons VPH	144	D	mg/L	EPA 5030/8015m		10/05/94	10/05/94	SPM

Benzene	44.3	D	mg/L	EPA 602		10/05/94	10/05/94	SPM
Toluene	31.9	D	mg/L	EPA 602		10/05/94	10/05/94	SPM
Ethylbenzene	3.07	D	mg/L	EPA 602		10/05/94	10/05/94	SPM
p & m Xylene	8.04	D	mg/L	EPA 602		10/05/94	10/05/94	SPM
o-Xylene	3.57	D	mg/L	EPA 602		10/05/94	10/05/94	SPM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.4989-3
Client Sample ID	Y204-3-B3MWW4
Matrix	WATER

Client Name	SHANNON & WILSON, INC.
Ordered By	SUSAN GUHL
Project Name	GARRETT'S
Project#	Y204-3
WSID	UA

WORK Order	82613		
Printed Date	10/11/94	@16:06	hrs.
Collected Date	09/29/94	@11:25	hrs.
Received Date	09/29/94	@11:55	hrs.

Technical Director STEPHEN C. EDE

Released By: S Shannon Paxton

Sample Remarks: SAMPLE COLLECTED BY: M.C.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
TPH & BTEX				5030/8015M/602				
Hydrocarbons VPH	6.11	D	mg/L	EPA 5030/8015m		10/03/94	10/03/94	SPM

Benzene	0.168	D	mg/L	EPA 602		10/03/94	10/03/94	SPM
Toluene	0.166	D	mg/L	EPA 602		10/03/94	10/03/94	SPM
Ethylbenzene	0.063	D	mg/L	EPA 602		10/03/94	10/03/94	SPM
p & m Xylene	0.157	D	mg/L	EPA 602		10/03/94	10/03/94	SPM
o-Xylene	0.042	D	mg/L	EPA 602		10/03/94	10/03/94	SPM

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

Chain of Custody Record

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(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Page 1 of 1

Laboratory CTYE

Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

94.4989

	Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	EPA 602 BTEX	EPA 8015 GRO					Total Number of Containers	Remarks/Matrix
1	Y204-3-B1MWW4		11:05	9-29-94			X	X					2	Water
2	Y204-3-B2MWW4		11:11	"			X	X					2	"
3	Y204-3-B3MWW4		11:25	"			X	X					2	"

Project Information

Project Number: Y204-3
Project Name: Garrett's
Contact: Susan Guhl
Ongoing Project? Yes [X] No [ ]
Sampler: Melisa Collett

Sample Receipt

Total Number of Containers	6
COC Seals/Intact Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attached shipping bill, if any)	

Instructions

Requested Turn Around Time: NORMAL
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Melisa A. Collett Time: 11:55	Signature: Time:	Signature: Time:
Printed Name: Melisa L. Collett Date: 9-29-94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Laura Hopkins Time: 11:55	Signature: Time:	Signature: Time:
Printed Name: Laura Hopkins Date: 9/29	Printed Name: Date:	Printed Name: Date:
Company: C. T. & E.	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

2253

RESULTS FOR AMBIENT AIR VAPOR BADGE SAMPLES

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3219-1
lient Sample ID	Y204-3 ASI-2
latrix	OTHER

lient Name	SHANNON & WILSON, INC.
rdered By	S. GUHL
roject Name	GARRETTS
Project#	Y204-3
WSID	UA

WORK Order	79896		
Printed Date	07/11/94	@ 15:18	hrs.
Collected Date		@	hrs.
Received Date	06/28/94	@ 14:30	hrs.

Technical Director STEPHEN C. EDE

Released By: Shannon Patton

mple Remarks: SAMPLE COLLECTED BY: M.C./J.R. MATRIX = VAPOR CANISTERS.

arameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
PH & BTEX				EPA 8015M/8020				
drocarbons VPH	0.0084		ppm	EPA 5030/8015m		07/05/94	07/05/94	MDU

Benzene	0.0018		ppm	EPA 8020		07/05/94	07/05/94	MDU
luene	0.0047		ppm	EPA 8020		07/05/94	07/05/94	MDU
hylbenzene	0.0011	U	ppm	EPA 8020		07/05/94	07/05/94	MDU
p&m Xylene	0.0023		ppm	EPA 8020		07/05/94	07/05/94	MDU
Xylene	0.0011	U	ppm	EPA 8020		07/05/94	07/05/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3219-2
lient Sample ID	Y204-3 AS2-2
latrix	OTHER
Client Name	SHANNON & WILSON, INC.
rdered By	S. GUHL
roject Name	GARRETTS
Project#	Y204-3
WSID	UA

WORK Order	79896		
Printed Date	07/11/94	@ 15:18	hrs.
Collected Date		@	hrs.
Received Date	06/28/94	@ 14:30	hrs.

Technical Director STEPHEN C. EDE

Released By:

ample Remarks: SAMPLE COLLECTED BY: M.C./J.R. MATRIX = VAPOR CANISTERS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
PH & BTEX				EPA 8015M/8020				
ydrocarbons VPH	0.0147		ppm	EPA 5030/8015m		07/05/94	07/06/94	MDU

Benzene	0.0038		ppm	EPA 8020		07/05/94	07/06/94	MDU
oluene	0.0080		ppm	EPA 8020		07/05/94	07/06/94	MDU
hylbenzene	0.0011	U	ppm	EPA 8020		07/05/94	07/06/94	MDU
p&m Xylene	0.0036		ppm	EPA 8020		07/05/94	07/06/94	MDU
Xylene	0.0013		ppm	EPA 8020		07/05/94	07/06/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.# 94.3219-3
Client Sample ID Y204-3 AS3-2
Matrix OTHER

Client Name SHANNON & WILSON, INC.
Ordered By S. GUHL
Project Name GARRETTS
Project# Y204-3
WSID UA

WORK Order 79896
Printed Date 07/11/94 @15:18 hrs.
Collected Date @ hrs.
Received Date 06/28/94 @14:30 hrs.

Technical Director STEPHEN C. EDE

Released By: S. Hamm Patton

Sample Remarks: SAMPLE COLLECTED BY: M.C./J.R. MATRIX = VAPOR CANISTERS.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
PH & BTEX				EPA 8015M/8020				
Hydrocarbons VPH	0.0068		ppm	EPA 5030/8015m		07/05/94	07/06/94	MDU

Benzene	0.0012	U	ppm	EPA 8020		07/05/94	07/06/94	MDU
Toluene	0.0036		ppm	EPA 8020		07/05/94	07/06/94	MDU
Ethylbenzene	0.0012	U	ppm	EPA 8020		07/05/94	07/06/94	MDU
p&m Xylene	0.0017		ppm	EPA 8020		07/05/94	07/06/94	MDU
o-Xylene	0.0012	U	ppm	EPA 8020		07/05/94	07/06/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

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NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3219-4
lient Sample ID	Y204-3 AS4-2
latrix	OTHER

Client Name	SHANNON & WILSON, INC.
rdered By	S. GUHL
roject Name	GARRETTS
Project#	Y204-3
WSID	UA

WORK Order	79896		
Printed Date	07/11/94	@ 15:18	hrs.
Collected Date		@	hrs.
Received Date	06/28/94	@ 14:30	hrs.

Technical Director STEPHEN C. EDE

Released By:

ımple Remarks: SAMPLE COLLECTED BY: M.C./J.R. MATRIX = VAPOR CANISTERS.

arameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
PH & BTEX ydrocarbons VPH	0.0100		ppm	EPA 8015M/8020 EPA 5030/8015m		07/05/94	07/06/94	MDU
Benzene	0.0022		ppm	EPA 8020		07/05/94	07/06/94	MDU
oluene	0.0056		ppm	EPA 8020		07/05/94	07/06/94	MDU
hylbenzene	0.0011	U	ppm	EPA 8020		07/05/94	07/06/94	MDU
p&m Xylene	0.0026		ppm	EPA 8020		07/05/94	07/06/94	MDU
- Xylene	0.0011	U	ppm	EPA 8020		07/05/94	07/06/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

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NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

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(314) 872-8170

2055 Hill Road
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5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

Chain of Custody Record

Page 1 of 1

Laboratory CT+E

Attn: _____

94.3217

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time (military)	Date Sampled	Comp.	Grab	EPA 8020 BTEX	EPA 8015 TPH						Total Number of Containers	Remarks/Matrix
(1)	Y204-3 AS1-2		5700 min	6-24 to 6-25-94			X	X						1	35.0 organic vapor meter
(2)	Y204-3 AS2-2		5690 min	"			X	X						1	"
(3)	Y204-3 AS3-X2		5690 min	"			X	X						1	"
(4)	Y204-3 AS4-2		5700 min	"			X	X						1	"

Project Information

Project Number: Y204-3
Project Name: Garretts
Contact: S. Cahill
Ongoing Project? Yes [X] No [ ]
Sampler: M.C. / J.B.

Sample Receipt

Total Number of Containers:
COC Seals/Intact Y/N/NA:
Received Good Cond./Cold:
Delivery Method:
(attached shipping bill, if any)

Instructions

Requested Turn Around Time: regular
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Melissa L. Collett Time: 14:30	Signature: Time:	Signature: Time:
Printed Name: Melissa L. Collett Date: 6-28-94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Jody L. Maus Time: 1430	Signature: Time:	Signature: Time:
Printed Name: Jody L. Maus Date: 6/28/94	Printed Name: Date:	Printed Name: Date:
Company: CT+E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

2299

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3734-1
lient Sample ID	Y-204-3 ASI-3
.latrix	OTHER

Client Name	SHANNON & WILSON, INC.	WORK Order	80673	
rdered By	SUSAN GUHL	Printed Date	08/03/94	@ 14:30 hrs.
rroject Name	GARRETT'S	Collected Date		@ hrs.
Project#	Y204-3	Received Date	07/23/94	@ 12:10 hrs.
WSID	UA			

Technical Director STEPHEN C. EDE

Released By: Stephen C. Ede

_ample Remarks: SAMPLE COLLECTED BY: MLC/JAZ. MATRIX = BADGES.

rarameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
PH & BTEX				EPA 8015M/8020				
ydrocarbons VPH	0.0985		ppm	EPA 5030/8015m		08/02/94	08/02/94	MDU

Benzene	0.0064		ppm	EPA 8020		08/02/94	08/02/94	MDU
)luene	0.0275		ppm	EPA 8020		08/02/94	08/02/94	MDU
_hylbenzene	0.0018		ppm	EPA 8020		08/02/94	08/02/94	MDU
p&m Xylene	0.0090		ppm	EPA 8020		08/02/94	08/02/94	MDU
Xylene	0.0032		ppm	EPA 8020		08/02/94	08/02/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3734-2
lient Sample ID	Y204-3 AS2-3
..latrix	OTHER

Client Name	SHANNON & WILSON, INC.	WORK Order	80673	
rdered By	SUSAN GUHL	Printed Date	08/03/94	@ 14:24 hrs.
rroject Name	GARRETT'S	Collected Date		@ hrs.
Project#	Y204-3	Received Date	07/23/94	@ 12:10 hrs.
WSID	UA			

Technical Director: STEPHEN C. EDE

Released By: Stephen C. Ede

_ample Remarks: SAMPLE COLLECTED BY: MLC/JAZ. MATRIX = BADGES.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
PH & BTEX				EPA 8015M/8020				
ydrocarbons VPH	0.0295		ppm	EPA 5030/8015m		08/02/94	08/02/94	JLB

Benzene	0.0058		ppm	EPA 8020		08/02/94	08/02/94	JLB
)luene	0.0111		ppm	EPA 8020		08/02/94	08/02/94	JLB
_hylbenzene	0.0015		ppm	EPA 8020		08/02/94	08/02/94	JLB
p&m Xylene	0.0050		ppm	EPA 8020		08/02/94	08/02/94	JLB
Xylene	0.0018		ppm	EPA 8020		08/02/94	08/02/94	JLB

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3734-3
lient Sample ID	Y204-3 AS3-3
latrix	OTHER

Client Name	SHANNON & WILSON, INC.	WORK Order	80673	
rdered By	SUSAN GUHL	Printed Date	08/03/94	@ 14:24 hrs.
roject Name	GARRETT'S	Collected Date		@ hrs.
Project#	Y204-3	Received Date	07/23/94	@ 12:10 hrs.
WSID	UA			

Technical Director STEPHEN C. EDE

Released By: Stephen C. Ede

mple Remarks: SAMPLE COLLECTED BY: MLC/JAZ. MATRIX = BADGES.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
PH & BTEX				EPA 8015M/8020				
ydrocarbons VPH	0.0394		ppm	EPA 5030/8015m		08/02/94	08/02/94	MDU

Benzene	0.0037		ppm	EPA 8020		08/02/94	08/02/94	MDU
oluene	0.0092		ppm	EPA 8020		08/02/94	08/02/94	MDU
hylbenzene	0.0010	U	ppm	EPA 8020		08/02/94	08/02/94	MDU
p&m Xylene	0.0044		ppm	EPA 8020		08/02/94	08/02/94	MDU
- Xylene	0.0017		ppm	EPA 8020		08/02/94	08/02/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

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NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.3734-4
lient Sample ID	Y204-3 AS4-3
.latrix	OTHER

Client Name	SHANNON & WILSON, INC.	WORK Order	80673	
rdered By	SUSAN GUHL	Printed Date	08/03/94	@ 14:24 hrs.
rroject Name	GARRETT'S	Collected Date		@ hrs.
Project#	Y204-3	Received Date	07/23/94	@ 12:10 hrs.
WSID	UA			

Technical Director STEPHEN C. EDE

Released By: Stephen C. Ede

ample Remarks: SAMPLE COLLECTED BY: MLC/JAZ. MATRIX = BADGES.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
PH & BTEX				EPA 8015M/8020				
ydrocarbons VPH	0.0257		ppm	EPA 5030/8015m		08/02/94	08/02/94	MDU

Benzene	0.0026		ppm	EPA 8020		08/02/94	08/02/94	MDU
oluene	0.0063		ppm	EPA 8020		08/02/94	08/02/94	MDU
hylbenzene	0.0010	U	ppm	EPA 8020		08/02/94	08/02/94	MDU
p&m Xylene	0.0031		ppm	EPA 8020		08/02/94	08/02/94	MDU
Xylene	0.0013		ppm	EPA 8020		08/02/94	08/02/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

94.3734

Shannon & Wilson, Inc.

Chain of Custody Record

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
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Fax (907) 561-4483

Page 1 of 1
Laboratory C.T.+E.
Attn: _____

Analysis Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Time (minutes)	Date Sampled	Comp.	Grab	EPA 8020 BTEX	EPA 8015 VPH						Total Number of Containers	Remarks/Matrix
(1)	Y-204-3 AS1-3	✓	5812	7-19 to 7-23-94			X	X						1	3520 organic vapor monitor
(2)	Y204-3 AS2-3	✓	5814	"			X	X						1	"
(3)	Y204-3 AS3-3	✓	5797	"			X	X						1	"
(4)	Y204-3 AS4-3	✓	5802	"			X	X						1	"

Project Information	
Project Number:	Y204-3
Project Name:	Garrett's
Contact:	Susan Guhl
Ongoing Project? Yes [X] No [ ]	
Sampler:	MLC/JAZ

Sample Receipt	
Total Number of Containers	4
COC Seals/Intact Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attached shipping bill, if any)	

Instructions

Requested Turn Around Time: regular

Special Instructions:
Pls. FAX results

Relinquished By: 1	Relinquished By: 2	Relinquished By: 3
Signature: James A Zschau Time: 1210	Signature: Time:	Signature: Time:
Printed Name: James A. Zschau Date: 7-23-94	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1	Received By: 2	Received By: 3
Signature: Laura Hopkins Time: 12:10	Signature: Time:	Signature: Time:
Printed Name: Laura Hopkins Date: 7-23-94	Printed Name: Date:	Printed Name: Date:
Company: C.T.+E.	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

0274

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.4272-1
lient Sample ID	Y204-3 AS1-4
latrix	OTHER

Client Name	SHANNON & WILSON, INC.	WORK Order	81563	
rdered By	SUSAN GUHL	Printed Date	09/06/94 @16:32	hrs.
roject Name	GARRETT'S	Collected Date	@	hrs.
Project#	Y204-3	Received Date	08/19/94 @16:50	hrs.
WSID	UA			
		Technical Director	STEPHEN C. EDE	

Released By: S Thomas Preston

ample Remarks: SAMPLE COLLECTED BY: MELISA COLLETT. MATRIX = BADGES.

arameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
PH & BTEX Air				NIOSH 1501	n/a			
olatile Hydrocarbons	0.060		ppm	NIOSH 1501		08/26/94	08/26/94	MDU
Benzene	0.0068		ppm	NIOSH 1501		08/26/94	08/26/94	MDU
Toluene	0.014		ppm	NIOSH 1501		08/26/94	08/26/94	MDU
thyl Benzene	0.0016		ppm	NIOSH 1501		08/26/94	08/26/94	MDU
&m Xylene	0.0076		ppm	NIOSH 1501		08/26/94	08/26/94	MDU
o-Xylene	0.0029		ppm	NIOSH 1501		08/26/94	08/26/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

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LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.4272-2
Client Sample ID	Y204-3 AS2-4
Matrix	OTHER

Client Name	SHANNON & WILSON, INC.	WORK Order	81563	
Ordered By	SUSAN GUHL	Printed Date	09/06/94	@ 16:32 hrs.
Project Name	GARRETTS	Collected Date		@ hrs.
Project#	Y204-3	Received Date	08/19/94	@ 16:50 hrs.
PWSID	UA			

Technical Director STEPHEN C. EDE

Released By: Shannon Parker

Sample Remarks: SAMPLE COLLECTED BY: MELISA COLLETT. MATRIX = BADGES.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
TPH & BTEX Air				NIOSH 1501	n/a			
Volatile Hydrocarbons	0.0294		ppm	NIOSH 1501		08/26/94	08/26/94	MDU
Benzene	0.0040		ppm	NIOSH 1501		08/26/94	08/26/94	MDU
Toluene	0.0094		ppm	NIOSH 1501		08/26/94	08/26/94	MDU
Ethyl Benzene	0.0014		ppm	NIOSH 1501		08/26/94	08/26/94	MDU
m,p Xylene	0.0045		ppm	NIOSH 1501		08/26/94	08/26/94	MDU
o-Xylene	0.0017		ppm	NIOSH 1501		08/26/94	08/26/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.4272-3
Client Sample ID	Y204-3 AS3-4
Matrix	OTHER

Client Name	SHANNON & WILSON, INC.	WORK Order	81563	
Ordered By	SUSAN GUHL	Printed Date	09/06/94	@ 16:32 hrs.
Project Name	GARRETTS	Collected Date		@ hrs.
Project#	Y204-3	Received Date	08/19/94	@ 16:50 hrs.
PWSID	UA			

Technical Director STEPHEN C. EDE

Released By: Shannon Parker

Sample Remarks: SAMPLE COLLECTED BY: MELISA COLLETT. MATRIX = BADGES.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
VPH & BTEX Air				NIOSH 1501	n/a			
Volatile Hydrocarbons	0.0329		ppm	NIOSH 1501		08/26/94	08/26/94	MDU
Benzene	0.0031		ppm	NIOSH 1501		08/26/94	08/26/94	MDU
Toluene	0.0078		ppm	NIOSH 1501		08/26/94	08/26/94	MDU
Ethyl Benzene	0.0011	U	ppm	NIOSH 1501		08/26/94	08/26/94	MDU
m,p Xylene	0.0038		ppm	NIOSH 1501		08/26/94	08/26/94	MDU
o-Xylene	0.0014		ppm	NIOSH 1501		08/26/94	08/26/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Commercial Testing & Engineering Co.

SINCE 1908

Environmental Laboratory Services

LABORATORY ANALYSIS REPORT

CT&E Ref.#	94.4272-4
Client Sample ID	Y204-3 AS4-4
Matrix	OTHER

Client Name	SHANNON & WILSON, INC.	WORK Order	81563	
Ordered By	SUSAN GUHL	Printed Date	09/06/94	@ 16:32 hrs.
Project Name	GARRETTS	Collected Date		@ hrs.
Project#	Y204-3	Received Date	08/19/94	@ 16:50 hrs.
PWSID	UA			

Technical Director STEPHEN C. EDE

Released By: Shannon Parker

Sample Remarks: SAMPLE COLLECTED BY: MELISA COLLETT. MATRIX = BADGES.

Parameter	Results	QC Qual	Units	Method	Allowable Limits	Ext. Date	Anal Date	Init
TPH & BTEX Air				NIOSH 1501	n/a			
Volatile Hydrocarbons	0.0175		ppm	NIOSH 1501		08/26/94	08/29/94	MDU
Benzene	0.0035		ppm	NIOSH 1501		08/26/94	08/29/94	MDU
Toluene	0.0090		ppm	NIOSH 1501		08/26/94	08/29/94	MDU
Ethyl Benzene	0.0013		ppm	NIOSH 1501		08/26/94	08/29/94	MDU
m&p Xylene	0.0045		ppm	NIOSH 1501		08/26/94	08/29/94	MDU
o-Xylene	0.0016		ppm	NIOSH 1501		08/26/94	08/29/94	MDU

* See Special Instructions Above
** See Sample Remarks Above
U = Undetected, Reported value is the practical quantification limit.
D = Secondary dilution.

UA = Unavailable
NA = Not Analyzed
LT = Less Than
GT = Greater Than

Shannon & Wilson, Inc.

94.4272

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

11500 Olive Blvd., Suite 276
St. Louis, MO 63141
(314) 872-8170

2055 Hill Road
Fairbanks, AK 99707
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120
Fax (907) 561-4483

ıstody Record

Page 1 of 1

Laboratory C T+E

Attn: _____

is Parameters/Sample Container Description
(include preservative if used)

	Sample Identity	Lab No.	Min Time	Date Sampled	Comp.	Grab	EPA 8020 BTEX	EPA 8015 VPH					Total Number of Containers	Remarks/Matrix
(1)	Y204-3 AS1-4	✓	~5790	8/5-8/8/94			X	X					1	3520 organic vapor monitor
(2)	Y204.3 AS2-4	✓	"	"			X	X					1	"
(3)	Y204-3 AS3-4	✓	"	"			X	X					1	"
(4)	Y204-3 AS4-4	✓	"	"			X	X					1	"

Project Information

Project Number: Y204-3
Project Name: Garrett's
Contact: Susan Guhl
Ongoing Project? Yes [X] No [ ]
Sampler: Melisa Gillett

Sample Receipt

Total Number of Containers	4
COC Seals/Intact Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attached shipping bill, if any)	

Instructions

Requested Turn Around Time: regular

Special Instructions:
Pls FAX results

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Melisa L. Collett Time:	Signature: Time:	Signature: Time:
Printed Name: Melisa L. Collett Date: 8/19/94	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Laura L Hopkins Time: 1650	Signature: Time:	Signature: Time:
Printed Name: Laura L. Hopkins Date: 8/19/94	Printed Name: Date:	Printed Name: Date:
Company: C.T.+E	Company:	Company:

Distribution: White - w/ shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/ shipment - for consignee files
Pink - Shannon & Wilson - job file

F-19-91/UR-r9/92

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