

HAHN AND ASSOCIATES, INC.
ENVIRONMENTAL CONSULTANTS

**DEPT OF ENVIRONMENTAL QUALITY
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APR 24 2001

April 20, 2001

Mr. Eric Blischke
Oregon Department of Environmental Quality
Voluntary Cleanup and Site Assessment Section
2020 SW 4th Avenue, Suite 400
Portland Oregon 97201-4987

NORTHWEST REGION

HAI Project No. 2708

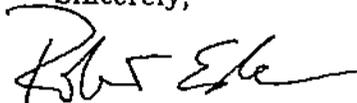
SUBJECT: Supplemental Soil Quality Investigation Report, NW Natural - Gasco Facility,
7900 NW St. Helens Road, Portland, Oregon

Dear Mr. Blischke:

At the request of NW Natural, Hahn and Associates, Inc. is pleased to submit two copies of the report entitled *Supplemental Soil Quality Investigation Report, NW Natural - Gasco Facility, 7900 NW St. Helens Road, Portland, Oregon*, dated April 20, 2001.

If you have any questions regarding this report, please contact the undersigned.

Sincerely,



Robert Ede, R.G.
Sr. Project Manager

enclosure

c: Mr. Bob Wyatt, NW Natural
Mr. Richard Bach, Steel Rives LLP
Mr. Steve Cappellino, Anchor Environmental LLC

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**SUPPLEMENTAL SOIL QUALITY
INVESTIGATION REPORT**

NW Natural
Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

April 20, 2001

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April 20, 2001

Prepared for:

NW Natural
Portland, Oregon

Prepared by:

Hahn and Associates, Inc.
Portland, Oregon

HAI Project No. 2708

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SUPPLEMENTAL SOIL QUALITY INVESTIGATION REPORT

NW Natural – Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

April 20, 2001

1. Introduction

As provided within a 1998 Phase I Remedial Investigation (RI) Summary Report¹, results of an assessment of soil data from the NW Natural – Gasco site identified a need for additional surface and shallow subsurface soil quality data at the site such that a thorough evaluation of potential human health and ecological risks could be completed for the upland portion of the site.

This report describes results of soil sampling activities that were completed in August 2000 such that data gaps with regard to completion of upland risk assessment activities at the former Gasco site could be eliminated.

2. Scope of Work

The soil sampling activities summarized in this report, as carried out at the site on August, 28 and 29, 2000, were performed in accordance with a July 27, 1999 Decision Management Associates, LLC (DMA) Work Plan² and a subsequent August 15, 2000 HAI sampling plan addendum³. The overall scope of work for the supplemental soil sampling activities conducted in August 2000 included the following:

- 1) Installation of 17 push probe borings (B-36 through B-52) at pre-determined locations across the site to provide for screening and sampling of soil.

¹Hahn and Associates, Inc. (1998). *Phase I Remedial Investigation Summary Report and Preliminary Analysis of Soil Data, NW Natural – Gasco Facility, 7900 NW St. Helens Road, Portland, Oregon.* October 9, 1998.

²Decision Management Associates, LLC (1999). *Technical Memorandum: Recommended Additional Data for Upland Risk Assessment.* July 27, 1999.

³Hahn and Associates, Inc. (2000). *Proposed Revisions to Soil Sampling Plan for Upland Risk Assessment, NW Natural – Gasco Facility, 7900 NW St. Helens Road, Portland, Oregon.* August 15, 2000.

- 2) Collection of surface soil samples (0 to 0.2 feet below ground surface (bgs)) and subsurface soil samples across depths correlating to the zone of potential excavation worker contact (i.e., upper 12 feet of soil).
- 3) Installation of one soil boring (B-47) to a depth of 32 feet bgs to evaluate the on-site lateral extent of residual tar and oil tar in soil to the northeast of the liquified natural gas (LNG) containment basin.
- 4) Laboratory analyses of selected soil samples.
- 5) Data synthesis and report preparation.

3. Field Activities

3.1 Sampling Depths and Locations

Soil sampling activities were completed on August 28 and 29, 2000, and included the collection of 21 surface soil samples and 34 subsurface soil samples. Surface and subsurface soil samples were collected from 17 push probe borings (B-36 through B-52) installed across the site. An additional four surface soil samples (designated as SS-12 through SS-15) were collected at locations not corresponding to push probe boring locations. With the exception of boring B-47, all borings were installed to a depth of 12 feet below ground surface (bgs), a depth corresponding to the typical depth-range for construction or utility line excavations. All sampling locations are depicted on Figure 2.

The number and location of additional sampling locations, as depicted in Figure 2, were pre-selected based on the results of statistical evaluations of soil data as presented by DMA in a October 9, 1998 report⁴, as well as based on a visual evaluation site data distribution (i.e., locations beyond those statistically needed were added in order to provide more uniform data distribution across the site).

As specified within the Work Plan Addendum (HAI, 2000), subsurface soil samples were collected from two depths within each boring. The upper sample depth was selected at random to be between 1.0 and 5.5 feet bgs, while the deeper sample was collected 6.5 feet below the first sample, thereby limiting all soil sampling activities to the upper 12 feet of soil. Random sampling depths were generated through a Microsoft Excel spreadsheet using a random number function.

Boring B-47, installed to provide data both with regard to the risk assessment (soil quality shallower than 12 feet bgs), and to provide definition of residual tar and oil tar in soil to the northeast of the LNG containment basin, was installed to a depth of 32 feet bgs.

⁴ Decision Management Associates, LLC (1999). *Technical Memorandum: Recommended Additional Data for Upland Risk Assessment*. July 27, 1999.

The locations of all borings containing soil data within the 1 to 12-foot depth interval, including the August 2000 push probe borings, are shown on Figure 3. All surface soil sampling locations are depicted on Figure 2.

3.2 Drilling Procedures

The push probes were installed to depths ranging from 12 to 32 feet bgs by Geo-Tech Explorations, Inc. (Geo-Tech) of Tualatin, Oregon with a truck-mounted Geo-Probe Systems hydraulic hammer unit using 2-inch outside diameter (OD) hydraulically-driven steel rods.

Following completion of each push probe installation, the borings were backfilled with 3/8-inch bentonite chips to within 6 inches of the ground surface. Concrete or soil was placed in the upper 6 inches of the boring to match the surrounding land surface.

3.3 Soil Sampling and Screening Procedures

Surface samples were collected by hand from the upper 2 inches of surface material with the use of a clean stainless steel or nylon hand trowel. If asphalt or concrete was present at the surface, then the soil sample was collected immediately beneath this material.

Subsurface soil samples were collected from continuous soil cores that were collected within each boring using a 4-foot long 2.0-inch OD stainless steel Macro-Core sampler, fitted with a PVC liner. Soil samples were selected from the cores for field screening and laboratory analyses. The properties of all soils were noted in the field by an HAI geologist.

With regard to the collection of soil samples to undergo analysis for physical parameters (e.g., specific gravity, density, porosity), a 6-inch long PVC-sleeved soil sample was cut from the desired location of the soil core. The 6-inch long undisturbed core samples were immediately sealed with Teflon[®] sheeting and capped with plastic end-caps.

Samples to undergo chemical analyses were collected by hand from the desired depth within an opened PVC sleeve. Upon collection, each soil sample was immediately placed in a 4-ounce sample jar and capped with a teflon-lined lid. The sample jars and core samples were then labeled and transferred to a chilled container for shipment to the analytical laboratory. Standard sampling protocols, including the use of chain-of-custody documentation, were followed for all sampling procedures. The soil cores were field-screened for the presence of potential contamination by the visual, olfactory, sheen, and headspace vapor methods (Section 3.4).

Boring logs, which describe the soils encountered in the soil borings, are included in Appendix A. An estimate of the Unified Soil Classification System (USCS) soil type designation is shown on the boring logs. The USCS designation was a field estimate only and was not confirmed by laboratory analyses.

3.4 Soil Field Screening

Each soil core was screened in the field for the presence of organic contaminants by the visual, olfactory, sheen, and headspace vapor methods.

The presence of sheen was assessed by placing clean tap water in a black pan and introducing approximately 5 grams of disaggregated soil to the water. The observations for the presence or lack of sheen is a relative indicator of contamination and was noted on the boring log.

Organic vapor levels in the soil samples were determined by the headspace vapor method utilizing a MicroTIP Model MP-1000 equipped with a photoionization detector (PID) and a 10.6 electron volt (eV) lamp. Immediately following the collection of the sample, approximately 2 ounces of soil were placed in a one-quart plastic bag and sealed. The sample was then set aside for a minimum 20-minute stabilization period where the sample was allowed to reach ambient temperature. The detector probe was then inserted through the seal into the bag to collect the headspace sample. The results of the headspace screening were recorded on the boring log in parts per million (ppm). The results of the headspace method are used for qualitative screening purposes only.

3.5 Decontamination Procedures

All reusable drilling and soil sampling equipment was steam cleaned with potable water prior to use, and between boring locations, in order to prevent cross-contamination. All reusable soil sampling equipment was decontaminated after each sample by using a detergent solution wash, a dilute hexane wash, and two potable water rinses.

3.6 Investigative Derived Waste

Soil wastes generated during the soil sampling activities (sufficient volume to fill an approximate 15-gallon container) were placed within one labeled 10-yard drop box containing heavily contaminated soils derived from previous investigation activities at the site. These soils are currently undergoing a treatability study by NW Natural and Battelle National Laboratory in order to evaluate the applicability of fungal-based bio-remediation (i.e., mycoremediation) of site soils. Equipment decontamination water generated during soil sampling activities (approximately 100 gallons) was placed within the on-site carbon adsorption water treatment unit.

3.7 Location and Elevation Survey

All soil borings were surveyed for location and elevation on January 24, 2001 by an Oregon registered professional land surveyor. All survey data was collected within an accuracy of 0.01 feet vertically and 0.1 feet horizontally and was surveyed in feet mean sea level (msl), City of Portland datum.

4. Analytical Tests

Soil samples were shipped with chain-of-custody documentation in sealed and chilled containers to Environmental Services Laboratory, Inc. located in Portland, Oregon.

Soil samples were analyzed as provided within the sampling and analytical plans provided on Table 1 (surface soils) and Table 2 (subsurface soils). As provided within Tables 1 and 2, pre-selected soil samples were analyzed for one or more of the following: polynuclear aromatic hydrocarbons (PAHs) via U.S. Environmental Protection Agency (EPA) Method 8270 SIM; benzene, toluene, ethylbenzene, and xylenes (BTEX) via EPA Method 8021; Priority Pollutant metals via EPA Method 6010 and 7470; total organic carbon via ASTM Method D4129-82M; dry bulk density via ASTM Method E1109-86; and total porosity via ASA Method 921-2.2.

The results of the soil analytical testing are summarized on Tables 3 through 6. The laboratory reports and chain-of-custody documentation for the soil sampling activities are included in Appendix B.

5. Data Validation

The quality of the analytical data collected by HAI during the August 2000 soil sampling investigation was assessed to ensure that it is of acceptable quality for use in the risk assessment. The analytical data was subjected to a review of all field and laboratory quality assurance/quality control (QA/QC) measures. A review of the QA/QC data is summarized below:

- All samples were analyzed within appropriate holding times.
- All samples showed acceptable surrogate recoveries.
- No contaminants were detected in laboratory method blanks.
- Equipment calibration and laboratory control standards (LCS) were within acceptable ranges.
- Except as specified below, all matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within acceptable ranges.
- Except as specified below, all MS/MSD relative percent differences (RPD) were within acceptable limits.

The RPD between the sample and the laboratory sample duplicate was outside the control limits (20% RPD) for chromium and nickel for ESL run batch ICP-000906A. However, the RPD between the Matrix Spike (MS) and the Matrix Spike Duplicate (MSD) was within the control limits for this batch, thereby satisfying the method criteria.

Spike recoveries for various metals were outside control limits on two ESL run batches (ESL run batch ICP-00906A and -00906B). However, post-digestion spikes resulted in acceptable recoveries, and all batch and instrument QC was within method criteria, thereby validating each batch.

The matrix spike duplicate for pyrene for ESL sample 0008163-11B MSD (ESL run batch 1821) was outside control limits for pyrene. However, the matrix spike, laboratory control spike, and the laboratory control spike duplicate were all within control limits, therefore, validating the batch.

RPDs for detected PAHs in field duplicate samples range from a low of 5% to a high of 198%, while RPDs for detected metals in field duplicate samples were found range from a low of 0% to a high of 187%. This variability within field duplicate samples is likely the result of the variable distribution of contaminants (especially lampblack and/or tar fragments) within the fill, with these heterogeneities represented even within the approximate 6-inch thickness of soil represented by a single soil sample and its duplicate.

With the following exceptions, all laboratory reporting limits were sufficiently low such that chemical concentrations equal to or greater than ecological Screening Benchmark Values (SBVs) or Preliminary Remedial Goals (PRGs) for human health could be quantified. Exceptions include:

- Dibenzo(a,h)anthracene at the B-38 location (2 feet bgs), where a reporting limit of 0.5 ppm was applied, exceeding the 0.29 ppm PRG for this constituent.
- Thallium at the B-43 through B-51 locations, where a reporting limit of 100 ppm was applied, exceeding the 1 ppm ecological SBV for this constituent.
- Selenium at all locations (B-36 through B-51), where a reporting limit of 1.0 ppm was applied, exceeding the 0.3 ppm ecological SBV for this constituent.

The preceding instances of elevated detection limits will be accounted for and addressed through the risk screening process. Based on the QA/QC review, it appears that the data collected during the August 2000 soil sampling event are of sufficient quality for risk evaluation purposes.

6. Results

- August 2000 soil sampling activities were successful in providing 21 additional surface soil samples and 34 additional subsurface soil samples, distributed across the site, for use within the upland area human health and ecological risk assessment.
- As described in boring logs (Appendix A), and as summarized on Table 1, tar was identified in borings B-48 through B-50 (former tar effluent pond area), while lampblack was identified at borings B-38, B-47, B-48, B-49, and B-50. The identification of tar and/or lampblack within the surficial fill at the indicated locations is consistent with previous findings and the site conceptual model.

- No oil tar or tar was identified within boring B-47, installed to a depth of 32 feet bgs northeast of the LNG tank containment basin. Therefore, the soil profile from this boring fills a previously-identified data gap related to the northeastern edge of the LNG containment basin, where it was previously unknown whether oil or tar product was present in the subsurface at this portion of the site.
- With the exception of deeper soils identified at the B-47 location, all soils encountered during the investigation activities (i.e., shallower than 12 feet bgs) consisted of anthropogenically-emplaced surficial fill composed of silts, sands, and silty gravels. Groundwater was not encountered within any of the borings advanced to a depth of 12 feet bgs, while groundwater was identified at a depth of 17.5 feet bgs at the B-47 boring location.

At boring B-47, surficial fill was found to extend to an estimated depth of at least 23.5 feet bgs (interpretation of fill is based on the presence of lampblack). The silt unit, expected to occur at depths of between 25 and 28 feet bgs in the B-47 boring area, was not found to be present.

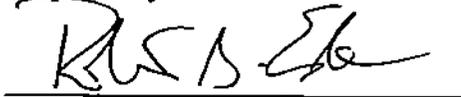
7. Limitations

The samples discussed in this report were collected, analyzed, and interpreted following the standards of care, skill, and diligence ordinarily provided by a professional in the performance of similar services as of the time the services were performed. This report and the conclusions and/or recommendations contained in it are based solely upon physical sampling and analytical activities that were conducted. The data presented in this report document only the concentrations of the target analytes in the particular sample and not the property as a whole.

Any questions regarding the information presented in this report are welcome and should be referred to the undersigned.

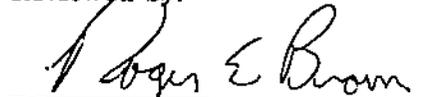
Hahn and Associates, Inc.

Prepared by:



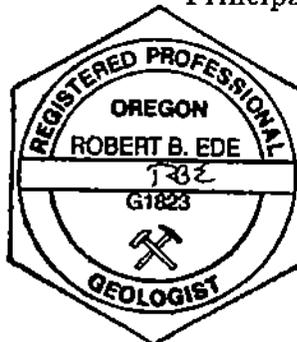
Robert B. Ede, R.G.
Sr. Project Manager

Reviewed by:



Roger E. Brown, R.G.
Principal

Date 4-20-01



GLOSSARY OF ABBREVIATIONS

bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
EPA	U. S. Environmental Protection Agency
HAI	Hahn and Associates, Inc.
LCS	laboratory control standards
LNG	liquified natural gas
MSD	matrix spike duplicate
msl	mean sea level
OAR	Oregon Administrative Rules
OD	outside diameter
ODEQ	Oregon Department of Environmental Quality
ORS	Oregon Revised Statutes
PAHs	polynuclear aromatic hydrocarbons
PID	photoionization detector
ppb	parts per billion
RPD	relative percent difference
QA/QC	quality assurance / quality control
USCS	Unified Soil Classification System

TABLES

Table 1 - Sampling and Analytical Plan: Surface Soils (0.0 to 0.2 Feet bgs)

Supplemental Soil Quality Investigation
 NW Natural - Gasco Facility
 7900 NW St. Helens Road
 Portland, Oregon

Project No. 2708

Sample Location	Area	Analytical Parameters					
		PAHs	BTEX	PP Metals	TOC	Dry Bulk Density	Total Porosity
SS-12	Former Retorts / Koppers	X		X			
SS-13	Former Retorts / Koppers	X		X			
SS-14	Former Retorts / Koppers	X		X			
SS-15	Former Retorts / Koppers	X		X			
B-36	Former Spent Oxide	X		X			
B-37	Former Spent Oxide	X		X			
B-38	Former Office Area	X		X			
B-39	Former Office Area	X		X			
B-40	Former Office Area	X		X			
B-41	Former Office Area	X		X			
B-42	Former Retorts / Koppers	X		X			
B-43	Former Retorts / Koppers	X		X			
B-44	Former Retorts / Koppers	X		X			
B-45	Former Retorts / Koppers	X		X			
B-46	Former Retorts / Koppers	X		X			
B-47	FAMM Area	X		X			
B-48	Former Tar Pond Area			X			
B-49	Former Tar Pond Area			X			
B-50	Former Tar Pond Area			X			
B-51	FAMM Area	X		X			
B-52	FAMM Area	X		X			
Total		18	0	21	0	0	0

NOTE:

BTEX = benzene, toluene, ethylbenzene, and xylenes

PAHs = polynuclear aromatic hydrocarbons

PP Metals = Priority Pollutant Metals

TOC = total organic carbon

Table 2 - Sampling and Analytical Plan: Subsurface Soils (1 to 12 feet bgs)

Supplemental Soil Quality Investigation
 NW Natural - Gasco Facility
 7900 NW St. Helens Road
 Portland, Oregon

Project No. 2708

Sample Location	Area	Upper Sample Depth ¹	Lower Sample Depth ²	Analytical Parameters								
				Upper Sample			Lower Sample			Other Sample ³		
				PAHs	BTEX	PP Metals	PAHs	BTEX	PP Metals	TOC	Total Porosity	Dry Bulk Density
B-36	Former Spent Oxide	3.5	10.0	X	X	X	X	X	X	X	X	X
B-37	Former Spent Oxide	4.5	11.0	X	X	X	X	X		X	X	X
B-38	Former Office Area	2.0	8.5	X	X	X	X	X		X	X	X
B-39	Former Office Area	3.0	9.5	X	X	X	X	X		X		
B-40	Former Office Area	2.5	9.5	X	X	X	X	X		X		
B-41	Former Office Area	2.5	9.5	X	X	X	X	X	X	X	X	X
B-42	Former Retorts / Koppers	1.0	7.5	X	X	X	X	X		X	X	X
B-43	Former Retorts / Koppers	2.0	8.5	X	X	X	X	X		X		
B-44	Former Retorts / Koppers	3.5	10.0	X	X	X	X	X		X		
B-45	Former Retorts / Koppers	2.0	8.5	X	X	X	X	X		X	X	X
B-46	Former Retorts / Koppers	5.0	10.5	X	X	X	X	X	X	X		
B-47	FAMM Area	5.0	11.5	X	X	X	X	X	X	X	X	X
B-48	Former Tar Pond Area	5.0	9.5	X	X	X	X	X		X	X	X
B-49	Former Tar Pond Area	1.5	8.0	X	X	X	X	X		X	X	X
B-50	Former Tar Pond Area	1.0	6.0	X	X	X	X	X	X	X		
B-51	FAMM Area	2.0	8.5			X				X	X	X
B-52	FAMM Area	3.5	10.0			X				X		
Total				15	15	17	15	15	5	17	10	10

NOTE: bgs = below ground surface
 BTEX = benzene, toluene, ethylbenzene, and xylenes
 PAHs = polynuclear aromatic hydrocarbons
 PP Metals = Priority Pollutant Metals
 TOC = total organic carbon
 1 = Randomly selected depth between 1.0 and 5.5 feet bgs
 2 = Collected 6.5 feet below the upper sample
 3 = Actual sample for analysis was selected in the field such that range of representative soil types was evaluated.

TABLE 3 – Summary of Analytical Results for Soil Samples: BTEX, Total PAHs

Supplemental Soil Quality Investigation
 NW Natural - Gasco Facility
 Portland, Oregon

Project No. 2708

Soil Boring Number	Sample Number ¹	Chain of Custody Number	Sample Date	Depth (feet bgs)	Field Observation				Analytical Results						
									EPA Method 8270 SIM		EPA Method 8021				
					Sheen	Oil Tar	Tar	Lamp Black	Carcinogenic PAHs	Total PAHs	Benzene	Toluene	Ethyl benzene	Xylenes	Total BTEX
B-36	000828-017	2708-S071	28-Aug-00	0.2					6,590.	11,090.	-	-	-	-	-
	000828-018	2708-S072	28-Aug-00	3.5					515.	1,160.	ND>2.94	ND>2.94	ND>2.94	ND>8.82	ND
	000828-019	2708-S073	28-Aug-00	10.0					315.	635.	ND>3.05	ND>3.05	ND>3.05	ND>9.15	ND
B-37	000828-001	2708-S071	28-Aug-00	0.2					36,040.	63,855.	-	-	-	-	-
	000828-002	2708-S072	28-Aug-00	4.5					1,965.	3,705.	ND>2.66	ND>2.66	ND>2.66	ND>7.98	ND
	000828-003	2708-S072	28-Aug-00	11.0				ND	ND	ND	ND>2.75	ND>2.75	ND>2.75	ND>8.24	ND
B-38	000828-014	2708-S071	28-Aug-00	0.2					10,390.	19,180.	-	-	-	-	-
	000828-015	2708-S072	28-Aug-00	2.0			X		4,900.	10,400.	ND>2.84	ND>2.84	ND>2.84	ND>8.52	ND
	000828-016	2708-S072	28-Aug-00	8.5			X		395.	720.	ND>3.05	ND>3.05	ND>3.05	ND>9.15	ND
B-39	000828-004	2708-S071	28-Aug-00	0.2					6,490.	11,570.	-	-	-	-	-
	000828-005	2708-S072	28-Aug-00	3.0				ND	ND	ND>2.94	ND>2.94	ND>2.94	ND>8.82	ND	
	000828-006	2708-S072	28-Aug-00	9.5				ND	ND	ND>2.78	ND>2.78	ND>2.78	ND>8.33	ND	
B-40	000828-010	2708-S071	28-Aug-00	0.2					32,380.	56,155.	-	-	-	-	-
	000828-011	2708-S072	28-Aug-00	2.5				ND	ND	ND>2.69	ND>2.69	ND>2.69	ND>8.06	ND	
	000828-012	2708-S072	28-Aug-00	9.5				ND	ND	ND>3.29	ND>3.29	ND>3.29	ND>9.87	ND	
B-41	000828-007	2708-S071	28-Aug-00	0.2					14,885.	27,285.	-	-	-	-	-
	000828-008	2708-S072	28-Aug-00	2.5					12,580.	26,430.	ND>2.78	ND>2.78	ND>2.78	ND>8.33	ND
	000828-009	2708-S072	28-Aug-00	9.5				ND	ND	ND>2.78	ND>2.78	ND>2.78	ND>8.33	ND	
B-42	000828-020	2708-S071	28-Aug-00	0.2					825.	1,520.	-	-	-	-	-
	000828-021	2708-S073	28-Aug-00	1.0					15,535.	29,745.	ND>2.69	ND>2.69	ND>2.69	ND>8.06	ND
	000828-022	2708-S073	28-Aug-00	7.5					2,000.	6,315.	ND>2.72	ND>2.72	ND>2.72	ND>8.15	ND
B-43	000829-050	2708-S075	29-Aug-00	0.2				pencil pitch	10,340.	331,605.	-	-	-	-	-
	000829-046	2708-S076	29-Aug-00	2.0					6,160.	10,835.	ND>2.66	ND>2.66	ND>2.66	ND>7.98	ND
	000829-047	2708-S076	29-Aug-00	2.0 (dup)					2,800.	4,235.	ND>2.69	ND>2.69	ND>2.69	ND>8.06	ND
	000829-048	2708-S076	29-Aug-00	8.5					25,818.	57,105.	ND>2.75	ND>2.75	ND>2.75	ND>8.24	ND
	000829-049	2708-S076	29-Aug-00	8.5 (dup)					184,750.	316,600.	ND>2.75	ND>2.75	ND>2.75	ND>8.24	ND
B-44	000829-052	2708-S075	29-Aug-00	0.2					32,280.	99,950.	-	-	-	-	-
	000829-051	2708-S076	29-Aug-00	3.5					5,525.	8,460.	ND>2.63	ND>2.63	ND>2.63	ND>7.89	ND
	000829-053	2708-S076	29-Aug-00	10.0	X			X	13,770.	62,405.	56,700.	9,210.	792.	8,650.	75,352.
EPA PRGs for Industrial Soil²					#	#	#	#	see Table 4	see Table 4	1,500.	520,000.	230,000.	210,000.	#

NOTE: bgs = below ground surface = benzene, toluene, ethylbenzene, and xylenes
 BTEX = benzene, toluene, ethylbenzene, and xylenes
 dup = field duplicate sample

EPA = U.S. Environmental Protection Agency
 ND = not detected above detection limit indicated
 PAHs = polynuclear aromatic hydrocarbons

ppb = parts per billion
 ug/kg = micrograms/kilogram
BOLD = Detected above Reference Level

1 = Sample number prefix: 2708-
 2 = Reference Levels are EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil, updated November 2000
 # = Reference level not established

TABLE 3 - Summary of Analytical Results for Soil Samples: BTEX, Total PAHs

Supplemental Soil Quality Investigation

NW Natural - Gasco Facility

Portland, Oregon

Project No. 2708

Soil Boring Number	Sample Number ¹	Chain of Custody Number	Sample Date	Depth (feet bgs)	Field Observation				Analytical Results						
									EPA Method 8270 SIM		EPA Method 8021				
					Sheen	Oil Tar	Tar	Lamp Black	Carcinogenic PAHs	Total PAHs	Benzene	Toluene	Ethyl benzene	Xylenes	Total BTEX
B-45	000829-054	2708-S075	29-Aug-00	0.2					234,250.	388,200.	-	-	-	-	-
	000829-055	2708-S076	29-Aug-00	2.0					60.	60.	ND>3.33	ND>3.33	ND>3.33	ND>10.0	ND
	000829-056	2708-S076	29-Aug-00	2.0 (dup)					85.	160.	ND>3.33	ND>3.33	ND>3.33	ND>10.0	ND
	000829-057	2708-S077	29-Aug-00	8.5					5,315.	8,355.	ND>2.81	ND>2.81	ND>2.81	ND>8.43	ND
B-46	000829-058	2708-S075	29-Aug-00	0.2					144,250.	240,150.	-	-	-	-	-
	000829-059	2708-S077	29-Aug-00	5.0					2,065.	3,135.	ND>2.72	ND>2.72	ND>2.72	ND>8.15	ND
	000829-060	2708-S077	29-Aug-00	10.5	X				140.	360.	ND>3.12	ND>3.12	ND>3.12	ND>9.38	ND
B-47	000829-039	2708-S075	29-Aug-00	0.2					2,390.	3,930.	-	-	-	-	-
	000829-040	2708-S075	29-Aug-00	0.2 (dup)					55.	55.	-	-	-	-	-
	000829-041	2708-S076	29-Aug-00	5.0			X		54,090.	105,890.	ND>3.01	ND>3.01	ND>3.01	ND>9.04	ND
	000829-042	2708-S076	29-Aug-00	11.5			X		214.	841.	ND>2.98	ND>2.98	ND>2.98	ND>8.93	ND
	000829-043	2708-S076	29-Aug-00	11.5 (dup)					875.	2,277.	ND>3.09	ND>3.09	ND>3.09	ND>9.26	ND
	000829-045	2708-S076	29-Aug-00	31.0					55.	181.	ND>2.94	4.26	16.8	61.6	83.
B-48	000828-031	2708-S073	28-Aug-00	5.0	X		X	X	230.	1,947.	107,000.	78,100.	103,000.	141,000.	429,100.
	000828-032	2708-S073	28-Aug-00	9.5	X		X	X	425.	2,387.	6,800.	8,260.	15,600.	19,800.	50,460.
B-49	000828-036	2708-S071	28-Aug-00	0.2					-	-	-	-	-	-	-
	000828-037	2708-S074	28-Aug-00	1.5				X	343,400.	562,100.	ND>3.01	ND>3.01	ND>3.01	ND>9.04	ND
	000828-038	2708-S074	28-Aug-00	8.0	X		X	X	634.	3,992.	1,780.	895.	18,000.	24,500.	45,175.
B-50	000828-033	2708-S071	28-Aug-00	0.2					-	-	-	-	-	-	-
	000828-034	2708-S073	28-Aug-00	1.0	X		X	X	370.	2,425.	14,300.	5,680.	21,200.	43,900.	85,080.
	000828-035	2708-S073	28-Aug-00	6.0	X		X	X	1,273.	10,586.	11,600.	ND>3,330	27,200.	31,500.	70,300.
B-51	000828-023	2708-S071	28-Aug-00	0.2					9,120.	19,055.	-	-	-	-	-
	000828-024	2708-S073	28-Aug-00	2.0					-	-	-	-	-	-	-
	000828-025	2708-S073	28-Aug-00	8.5					-	-	-	-	-	-	-
B-52	000828-026	2708-S071	28-Aug-00	0.2					7,355.	13,550.	-	-	-	-	-
	000828-027	2708-S073	28-Aug-00	3.5	X				-	-	-	-	-	-	-
	000828-028	2708-S073	28-Aug-00	10.5	X				-	-	-	-	-	-	-
	000828-029	2708-S073	28-Aug-00	10.5 (dup)	X				-	-	-	-	-	-	-
SS-12	000829-061	2708-S075	29-Aug-00	0.2					1,795.	2,925.	-	-	-	-	-
SS-13	000829-062	2708-S075	29-Aug-00	0.2					1,460.	3,720.	-	-	-	-	-
SS-14	000829-063	2708-S075	29-Aug-00	0.2					9,795.	16,500.	-	-	-	-	-
SS-15	000829-064	2708-S075	29-Aug-00	0.2					197,250.	662,000.	-	-	-	-	-
	000829-064	2708-S075	29-Aug-00	0.2 (dup)					314,500.	527,600.	-	-	-	-	-
EPA PRGs for Industrial Soil ²					#	#	#	#	see Table 4	see Table 4	1,500.	520,000.	230,000.	210,000.	#

NOTE: bgs = below ground surface = benzene, toluene, ethylbenzene, and xylenes
 BTEX = benzene, toluene, ethylbenzene, and xylenes
 dup = field duplicate sample

¹ = Sample number prefix: 2708-

² = Reference Levels are EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil, updated November 2000

EPA = U.S. Environmental Protection Agency
 ND = not detected above detection limit indicated
 PAHs = polynuclear aromatic hydrocarbons

ppb = parts per billion
 ug/kg = micrograms/kilogram
BOLD = Detected above Reference Level

Table 4 – Summary of Analytical Results for Soil Samples: PAHs by EPA Method 8270 (SIM)

Supplemental Soil Quality Investigation
 NW Natural - Gasco Facility
 Portland, Oregon

PAHs by EPA Method 8270 (SIM)					Analytical Results ug/kg (ppb)																		
Soil Boring	Sample Number (Prefix: 2708-)	Chain of Custody No.	Sample Date	Sample Depth (feet bgs)	Carcinogenic PAHs							Non-Carcinogenic PAHs										Total Carcinogenic PAHs	Total Non-Carcinogenic PAHs
					Benzo (a) anthracene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Chrysene	Dibenzo (ab) anthracene	Indeno (1,2,3-cd) pyrene	Acenaphthene	Acenaphthylene	Anthracene	Benzo (ghi) perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene			
B-36	000828-017	2708-S071	28-Aug-00	0.2	980.	1,230.	1,050.	1,380.	1,160.	215.	575.	105.	ND*	ND*	ND*	600.	1,520.	ND*	105.	700.	1,470.	6,590.	4,500.
	000828-018	2708-S072	28-Aug-00	3.5	70.	110.	65.	100.	80.	ND*	90.	ND*	ND*	ND*	130.	155.	ND*	120.	70.	170.	515.	645.	
	000828-019	2708-S073	28-Aug-00	10.0	90.	120.	ND*	50.	55.	ND*	ND*	ND*	ND*	ND*	ND*	80.	ND*	ND*	135.	105.	315.	320.	
B-37	000828-001	2708-S071	28-Aug-00	0.2	4,700.	6,500.	4,920.	7,350.	5,850.	1,670.	5,050.	455.	60.	735.	6,300.	8,550.	200.	55.	3,960.	7,500.	36,040.	27,815.	
	000828-002	2708-S072	28-Aug-00	4.5	250.	330.	250.	365.	300.	95.	375.	ND*	ND*	ND*	475.	540.	ND*	ND*	210.	515.	1,965.	1,740.	
	000828-003	2708-S072	28-Aug-00	11.0	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND	ND	
B-38	000828-014	2708-S071	28-Aug-00	0.2	1,580.	1,800.	1,120.	2,080.	1,760.	430.	1,620.	130.	ND*	ND*	1,930.	2,940.	ND*	ND*	1,110.	2,680.	10,390.	8,790.	
	000828-015	2708-S072	28-Aug-00	2.0	1,150.	1,550.	ND*	850.	800.	ND*	550.	ND*	ND*	650.	1,150.	ND*	ND*	1,850.	1,850.	4,900.	5,500.		
	000828-016	2708-S072	28-Aug-00	8.5	95.	135.	ND*	90.	75.	ND*	ND*	ND*	ND*	90.	ND*	ND*	ND*	135.	100.	395.	325.		
B-39	000828-004	2708-S071	28-Aug-00	0.2	1,000.	1,160.	705.	1,360.	1,130.	255.	880.	85.	55.	ND*	1,020.	1,620.	ND*	60.	520.	1,720.	6,490.	5,080.	
	000828-005	2708-S072	28-Aug-00	3.0	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND	ND	
	000828-006	2708-S072	28-Aug-00	9.5	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND	ND	
B-40	000828-010	2708-S071	28-Aug-00	0.2	4,860.	5,450.	4,140.	6,500.	5,200.	1,470.	4,760.	360.	65.	560.	5,800.	7,050.	140.	ND*	3,000.	6,800.	32,380.	23,775.	
	000828-011	2708-S072	28-Aug-00	2.5	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND	ND	
	000828-012	2708-S072	28-Aug-00	9.5	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND	ND	
B-41	000828-007	2708-S071	28-Aug-00	0.2	2,160.	2,640.	1,740.	3,100.	2,430.	595.	2,220.	165.	170.	ND*	2,560.	3,860.	70.	75.	1,680.	3,820.	14,885.	12,400.	
	000828-008	2708-S072	28-Aug-00	2.5	1,870.	2,130.	1,580.	2,860.	2,230.	420.	1,490.	130.	260.	410.	2,090.	3,260.	ND>100	240.	2,260.	5,200.	12,580.	13,850.	
	000828-009	2708-S072	28-Aug-00	9.5	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND	ND	
B-42	000828-020	2708-S071	28-Aug-00	0.2	120.	135.	170.	185.	160.	ND*	55.	ND*	ND*	ND*	180.	205.	ND*	ND*	115.	195.	825.	695.	
	000828-021	2708-S073	28-Aug-00	1.0	2,470.	2,470.	1,830.	3,260.	2,680.	605.	2,220.	220.	ND*	2,770.	4,860.	80.	180.	1,980.	4,120.	15,535.	14,210.		
	000828-022	2708-S073	28-Aug-00	7.5	255.	275.	210.	405.	370.	90.	395.	ND*	260.	ND*	675.	640.	85.	580.	1,360.	715.	2,000.	4,315.	
B-43	000829-050	2708-S075	29-Aug-00	0.2	1,490.	1,760.	1,460.	2,020.	1,650.	500.	1,460.	110,000.	ND>5,000	139,000.	1,600.	1,980.	55,000.	11,000.	825.	1,860.	10,340.	321,265.	
	000829-046	2708-S076	29-Aug-00	2.0	355.	950.	565.	1,260.	595.	345.	2,090.	ND*	165.	ND*	3,280.	490.	ND*	100.	105.	535.	6,160.	4,675.	
	000829-047	2708-S076	29-Aug-00	2.0 (dup)	160.	545.	315.	595.	275.	160.	750.	ND*	110.	ND*	1,030.	125.	ND*	ND*	170.	2,800.	1,435.		
	000829-048	2708-S076	29-Aug-00	8.5	125.	146.	118.	171.	138.	25,000.	120.	10,200.	ND*	14,200.	132.	172.	5,150.	1,200.	75.	158.	25,818.	31,287.	
	000829-049	2708-S076	29-Aug-00	8.5 (dup)	27,400.	35,200.	28,000.	40,400.	29,000.	6,150.	18,600.	2,500.	ND*	4,000.	19,800.	39,200.	1,150.	ND*	18,800.	46,400.	184,750.	131,850.	
B-44	000829-052	2708-S075	29-Aug-00	0.2	5,050.	4,580.	3,550.	6,850.	6,250.	1,080.	4,920.	170.	4,100.	3,170.	6,100.	14,500.	2,920.	1,210.	18,300.	17,200.	32,280.	67,670.	
	000829-051	2708-S076	29-Aug-00	3.5	500.	1,000.	595.	1,320.	755.	245.	1,110.	ND*	140.	ND*	1,550.	530.	ND*	ND*	715.	5,525.	2,935.		
	000829-053	2708-S076	29-Aug-00	10.0	2,450.	1,720.	1,700.	2,780.	2,880.	440.	1,800.	125.	3,480.	2,580.	2,000.	8,000.	1,900.	8,300.	14,000.	8,250.	13,770.	48,635.	
B-45	000829-054	2708-S075	29-Aug-00	0.2	33,600.	47,100.	36,600.	47,000.	38,500.	7,750.	23,700.	2,150.	ND*	4,300.	23,300.	52,500.	1,400.	ND*	24,800.	45,500.	234,250.	153,950.	
	000829-055	2708-S076	29-Aug-00	2.0	ND*	60.	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	60.	ND		
	000829-056	2708-S076	29-Aug-00	2.0 (dup)	ND*	85.	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	75.	ND*	ND*	ND*	ND*	85.	75.		
	000829-057	2708-S077	29-Aug-00	8.5	355.	980.	635.	1,050.	665.	230.	1,400.	ND*	210.	ND*	1,980.	360.	ND*	ND*	490.	5,315.	3,040.		
B-46	000829-058	2708-S075	29-Aug-00	0.2	19,500.	29,700.	21,900.	30,800.	22,800.	4,950.	14,600.	1,300.	ND*	2,450.	15,100.	29,600.	750.	ND*	14,300.	32,400.	144,250.	95,900.	
	000829-059	2708-S077	29-Aug-00	5.0	135.	385.	290.	480.	190.	150.	435.	ND*	75.	ND*	625.	95.	ND*	ND*	135.	2,065.	1,070.		
	000829-060	2708-S077	29-Aug-00	10.5	ND*	90.	ND*	ND*	ND*	ND*	50.	ND*	ND*	ND*	85.	ND*	ND*	ND*	135.	140.	220.		
B-47	000829-039	2708-S075	29-Aug-00	0.2	300.	445.	315.	445.	365.	135.	385.	ND*	ND*	ND*	480.	455.	ND*	ND*	180.	425.	2,390.	1,540.	
	000829-040	2708-S075	29-Aug-00	0.2 (dup)	ND*	ND*	55.	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	ND*	55.	ND		
	000829-041	2708-S076	29-Aug-00	5.0	8,700.	8,450.	7,850.	11,400.	9,450.	1,140.	7,100.	1,650.	ND*	2,140.	8,050.	15,600.	675.	85.	8,500.	15,100.	54,090.	51,800.	
	000829-042	2708-S076	29-Aug-00	11.5	42.	27.5	29.	40.	45.5	8.	21.5	59.5	ND*	76.5	23.5	136.	42.	12.	166.	112.	214.	628.	
	000829-043	2708-S076	29-Aug-00	11.5 (dup)	146.	132.	127.	176.	156.	30.	108.	100.	ND*	108.	120.	306.	69.	87.	332.	280.	875.	1,402.	
000829-045	2708-S076	29-Aug-00	31.0	8.2	7.65	6.85	12.	10.1	1.6	8.15	9.95	1.75	6.25	10.8	25.8	4.95	14.2	24.7	28.4	55.	127.		
EPA PRGs for Industrial Soil ¹					2,900.	2,900.	29,000.	290.	290,000.	290.	2,900.	38,000,000.	#	100,000,000.	#	30,000,000.	33,000,000.	190,000.	#	54,000,000.	#	#	

NOTE: bgs = below ground surface
 dup = field duplicate sample
 EPA = U.S. Environmental Protection Agency
 ND = Not detected above detection limit indicated

PAHs = polynuclear aromatic hydrocarbons
 ppb = parts per billion
 ug/kg = micrograms/kilogram
 # = Reference level not established
¹ = Reference Levels are EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil; updated November 2000

a = detection limit is 50 ug/kg (ppb)
 b = detection limit is 5 ug/kg (ppb)
 c = detection limit is 500 ug/kg (ppb)
 Bold = Detected above Reference Levels

Table 4 - Summary of Analytical Results for Soil Samples: PAHs by EPA Method 8270 (SIM)

Supplemental Soil Quality Investigation
 NW Natural - Gasco Facility
 Portland, Oregon

Project No. 2708

PAHs by EPA Method 8270 (SIM)					Analytical Results ug/kg (ppb)																		
Soil Boring	Sample Number (Prefix: 2708-)	Chain of Custody No.	Sample Date	Sample Depth (feet bgs)	Carcinogenic PAHs							Non-Carcinogenic PAHs										Total Carcinogenic PAHs	Total Non-Carcinogenic PAHs
					Benzo (a) anthracene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Chrysene	Dibenzo (ah) anthracene	Indeno (1,2,3-cd) pyrene	Acenaphthene	Acenaphthylene	Anthracene	Benzo (ghi) perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene			
B-48	000828-031	2708-S073	28-Aug-00	5.0	42.5	25.5	28.5	47.5	53.5	5.5	27.	72.5	47.5	59.	36.5	146.	54.5	835.	302.	164.	230.	1,717.	
	000828-032	2708-S073	28-Aug-00	9.5	77.	54.5	51.	88.	92.	11.	51.	114.	30.	77.5	65.	212.	65.	755.	386.	258.	425.	1,963.	
B-49	000828-036	2708-S071	28-Aug-00	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	000828-037	2708-S074	28-Aug-00	1.5	28,500.	66,000.	40,000.	114,000.	39,400.	9,400.	46,100.	650.	12,500.	2,100.	105,000.	22,800.	ND*	6,200.	8,950.	60,500.	343,400.	218,700.	
	000828-038	2708-S074	28-Aug-00	8.0	116.	77.	71.5	132.	140.	17.	80.5	199.	43.	121.	106.	334.	121.	1,300.	750.	384.	634.	3,358.	
B-50	000828-033	2708-S071	28-Aug-00	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	000828-034	2708-S073	28-Aug-00	1.0	69.	41.5	44.	76.5	86.	9.	43.5	145.	16.	86.	58.	220.	82.	760.	434.	254.	370.	2,055.	
	000828-035	2708-S073	28-Aug-00	6.0	244.	150.	142.	259.	284.	33.5	160.	344.	330.	342.	207.	875.	310.	4,100.	1,810.	995.	1,273.	9,313.	
B-51	000828-023	2708-S071	28-Aug-00	0.2	1,240.	1,600.	1,020.	1,740.	1,600.	390.	1,530.	60.	175.	ND*	1,820.	2,780.	65.	425.	2,020.	2,590.	9,120.	9,935.	
	000828-024	2708-S073	28-Aug-00	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	000828-025	2708-S073	28-Aug-00	8.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
B-52	000828-026	2708-S071	28-Aug-00	0.2	850.	1,350.	970.	1,520.	1,500.	245.	920.	ND*	130.	320.	1,140.	1,610.	ND*	230.	825.	1,940.	7,355.	6,195.	
	000828-027	2708-S073	28-Aug-00	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	000828-028	2708-S073	28-Aug-00	10.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	000828-029	2708-S073	28-Aug-00	10.5 (dup)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
SS-12	000829-061	2708-S075	29-Aug-00	0.2	255.	350.	290.	350.	265.	90.	195.	ND*	ND*	ND*	215.	375.	ND*	ND*	215.	325.	1,795.	1,130.	
SS-13	000829-062	2708-S075	29-Aug-00	0.2	205.	275.	220.	275.	235.	85.	165.	ND*	ND*	ND*	195.	1,040.	ND*	ND*	750.	275.	1,460.	2,260.	
SS-14	000829-063	2708-S075	29-Aug-00	0.2	1,340.	1,740.	1,520.	2,010.	1,600.	385.	1,200.	125.	ND*	ND*	1,340.	2,220.	50.	ND*	930.	2,040.	9,795.	6,705.	
SS-15	000829-064	2708-S075	29-Aug-00	0.2	40,700.	34,400.	25,600.	23,100.	58,500.	3,450.	11,500.	2,350.	2,500.	37,200.	12,000.	198,000.	3,200.	ND*	57,500.	152,000.	197,250.	464,750.	
	000829-065	2708-S075	29-Aug-00	0.2 (dup)	42,600.	60,500.	47,400.	68,500.	49,400.	11,400.	34,700.	3,100.	ND*	5,550.	33,800.	71,500.	1,750.	ND*	32,400.	65,000.	314,500.	213,100.	
EPA PRGs for Industrial Soil					2,900.	2,900.	29,000.	290.	290,000.	290.	2,900.	38,000,000.	#	100,000,000.	#	30,000,000.	33,000,000.	190,000.	#	54,000,000.	#	#	

NOTE: bgs = below ground surface
 dup = field duplicate sample
 EPA = U.S. Environmental Protection Agency
 ND = Not detected above detection limit indicated

PAHs = polynuclear aromatic hydrocarbons
 ppb = parts per billion
 ug/kg = micrograms/kilogram
 # = Reference level not established
 1 = Reference Levels are EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil; updated November 2000

a = detection limit is 50 ug/kg (ppb)
 b = detection limit is 5 ug/kg (ppb)
 c = detection limit is 500 ug/kg (ppb)
 Bold = Detected above Reference Levels

**TABLE 5 - Summary of Analytical Results for Soil Samples
Priority Pollutant Metals by EPA Methods 6010 and 7471**

Supplemental Soil Quality Investigation
NW Natural - Gasco Facility
Portland, Oregon

Project No. 2708

Total Metals by EPA Method 6010 and 7471					Analytical Results mg/kg (ppm)												
Soil Boring	Sample Number (Prefix: 2708-)	Chain of Custody Number	Sample Date	Sample Depth (feet bgs)	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
B-36	000828-017	2708-S071	28-Aug-00	0.2	1.27	4.16	ND ^a	ND ^a	18.	29.7	40.2	ND ^b	14.4	ND ^a	ND ^a	ND ^c	82.8
	000828-018	2708-S072	28-Aug-00	3.5	1.59	4.89	ND ^a	ND ^a	15.2	18.9	47.	ND ^b	12.3	ND ^a	ND ^a	ND ^c	67.3
	000828-019	2708-S073	28-Aug-00	10.0	1.26	2.07	ND ^a	ND ^a	6.58	13.1	8.56	ND ^b	6.91	ND ^a	ND ^a	ND ^c	45.2
B-37	000828-001	2708-S071	28-Aug-00	0.2	1.73	ND ^a	ND ^a	ND ^a	5.43	10.2	7.69	ND ^b	3.98	ND ^a	ND ^a	ND ^c	49.8
	000828-002	2708-S072	28-Aug-00	4.5	ND ^a	3.2	ND ^a	ND ^a	13.5	10.3	2.61	ND ^b	16.1	ND ^a	ND ^a	ND ^c	51.9
	000828-003	2708-S072	28-Aug-00	11.0	-	-	-	-	-	-	-	-	-	-	-	-	-
B-38	000828-014	2708-S071	28-Aug-00	0.2	1.71	5.26	ND ^a	ND ^a	24.7	52.1	33.5	ND ^b	25.6	ND ^a	ND ^a	ND ^c	69.3
	000828-015	2708-S072	28-Aug-00	2.0	2.92	6.37	ND ^a	ND ^a	19.7	35.2	40.3	ND ^b	17.9	ND ^a	ND ^a	ND ^c	70.3
	000828-016	2708-S072	28-Aug-00	8.5	-	-	-	-	-	-	-	-	-	-	-	-	-
B-39	000828-004	2708-S071	28-Aug-00	0.2	1.43	5.05	ND ^a	ND ^a	18.9	22.	36.6	ND ^b	84.	ND ^a	ND ^a	ND ^c	82.7
	000828-005	2708-S072	28-Aug-00	3.0	1.42	4.86	ND ^a	ND ^a	15.1	14.9	15.7	ND ^b	12.5	ND ^a	ND ^a	ND ^c	55.6
	000828-006	2708-S072	28-Aug-00	9.5	-	-	-	-	-	-	-	-	-	-	-	-	-
B-40	000828-010	2708-S071	28-Aug-00	0.2	1.01	3.39	ND ^a	ND ^a	16.2	23.2	55.4	ND ^b	39.8	ND ^a	ND ^a	ND ^c	92.9
	000828-011	2708-S072	28-Aug-00	2.5	ND ^a	2.69	ND ^a	ND ^a	13.1	12.2	2.27	ND ^b	15.6	ND ^a	ND ^a	ND ^c	36.9
	000828-012	2708-S072	28-Aug-00	9.5	-	-	-	-	-	-	-	-	-	-	-	-	-
B-41	000828-007	2708-S071	28-Aug-00	0.2	1.96	4.97	ND ^a	ND ^a	14.7	19.7	21.4	ND ^b	20.9	ND ^a	ND ^a	ND ^c	74.4
	000828-008	2708-S072	28-Aug-00	2.5	1.24	4.1	ND ^a	ND ^a	13.7	19.	24.6	ND ^b	21.1	ND ^a	ND ^a	ND ^c	57.9
	000828-009	2708-S072	28-Aug-00	9.5	ND ^a	2.55	ND ^a	ND ^a	12.9	12.5	1.94	ND ^b	15.3	ND ^a	ND ^a	ND ^c	36.2
B-42	000828-020	2708-S071	28-Aug-00	0.2	1.16	ND ^a	ND ^a	ND ^a	ND ^a	4.3	ND ^a	ND ^b	ND ^a	ND ^a	ND ^a	ND ^c	27.5
	000828-021	2708-S073	28-Aug-00	1.0	ND ^a	2.74	ND ^a	ND ^a	13.7	12.4	3.19	ND ^b	16.5	ND ^a	ND ^a	ND ^c	64.2
	000828-022	2708-S073	28-Aug-00	7.5	-	-	-	-	-	-	-	-	-	-	-	-	-
B-43	000829-050	2708-S075	29-Aug-00	0.2	3.76	3.04	ND ^a	ND ^a	22.3	40.9	94.6	3.23	19.8	ND ^a	ND ^a	ND ^c	226.
	000829-046	2708-S076	29-Aug-00	2.0	ND ^a	2.89	ND ^a	ND ^a	11.4	11.8	2.44	0.105	17.3	ND ^a	ND ^a	ND ^c	35.9
	000829-047	2708-S076	29-Aug-00	2.0 (dup)	ND ^a	2.93	ND ^a	ND ^a	12.3	11.8	1.97	ND ^b	15.5	ND ^a	ND ^a	ND ^c	36.8
	000829-048	2708-S076	29-Aug-00	8.5	-	-	-	-	-	-	-	-	-	-	-	-	-
	000829-049	2708-S076	29-Aug-00	8.5 (dup)	-	-	-	-	-	-	-	-	-	-	-	-	-
EPA PRGs for Industrial Soil ¹					820.	2.7	2,200.	810.	450.	76,000.	750.	610.	41,000.	10,000.	10,000.	130.	100,000.

NOTE: bgs = below ground surface
dup = field duplicate sample
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams per kilogram

ND = Not detected above detection limit indicated
ppm = parts per million
¹ = Reference Levels are EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil, updated November 2000
= Reference level not established

a = detection limit is 1.00 mg/kg (ppm)
b = detection limit is 0.100 mg/kg
c = detection limit is 10 mg/kg
Bold = Detected above Reference Levels

**TABLE 5 – Summary of Analytical Results for Soil Samples
Priority Pollutant Metals by EPA Methods 6010 and 7471**

Supplemental Soil Quality Investigation
NW Natural - Gasco Facility
Portland, Oregon

Project No. 2708

Total Metals by EPA Method 6010 and 7471					Analytical Results mg/kg (ppm)												
Soil Boring	Sample Number (Prefix: 2708-)	Chain of Custody Number	Sample Date	Sample Depth (feet bgs)	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
B-44	000829-052	2708-S075	29-Aug-00	0.2	ND ^a	3.4	ND ^a	ND ^a	12.6	12.5	1.76	ND ^b	14.6	ND ^a	ND ^a	ND ^c	37.9
	000829-051	2708-S076	29-Aug-00	3.5	ND ^a	2.46	ND ^a	ND ^a	10.8	11.9	1.7	ND ^b	13.8	ND ^a	ND ^a	ND ^c	36.1
	000829-053	2708-S076	29-Aug-00	10.0	-	-	-	-	-	-	-	-	-	-	-	-	-
B-45	000829-054	2708-S075	29-Aug-00	0.2	1.44	ND ^a	ND ^a	ND ^a	4.96	10.1	2.77	ND ^b	3.16	ND ^a	ND ^a	ND ^c	42.3
	000829-055	2708-S076	29-Aug-00	2.0	1.11	9.02	ND ^a	ND ^a	15.8	21.3	10.2	ND ^b	14.4	ND ^a	ND ^a	ND ^c	58.8
	000829-056	2708-S076	29-Aug-00	2.0 (dup)	1.02	5.52	ND ^a	ND ^a	16.5	70.7	31.1	ND ^b	18.9	ND ^a	ND ^a	ND ^c	60.4
	000829-057	2708-S077	29-Aug-00	8.5	-	-	-	-	-	-	-	-	-	-	-	-	-
B-46	000829-058	2708-S075	29-Aug-00	0.2	1.16	ND ^a	ND ^a	ND ^a	11.1	11.5	8.2	ND ^b	6.57	ND ^a	ND ^a	ND ^c	71.4
	000829-059	2708-S077	29-Aug-00	5.0	ND ^a	2.75	ND ^a	ND ^a	12.5	11.5	1.65	ND ^b	13.3	ND ^a	ND ^a	ND ^c	35.7
	000829-060	2708-S077	29-Aug-00	10.5	ND ^a	1.46	ND ^a	ND ^a	9.21	10.1	1.36	ND ^b	12.3	ND ^a	ND ^a	ND ^c	28.5
B-47	000829-039	2708-S075	29-Aug-00	0.2	1.57	ND ^a	ND ^a	ND ^a	1.8	5.87	ND ^a	ND ^b	1.1	ND ^a	ND ^a	ND ^c	33.4
	000829-040	2708-S075	29-Aug-00	0.2 (dup)	1.42	ND ^a	ND ^a	ND ^a	2.46	5.92	ND ^a	ND ^b	1.95	ND ^a	ND ^a	ND ^c	35.5
	000829-041	2708-S076	29-Aug-00	5.0	1.02	5.25	ND ^a	ND ^a	16.1	19.6	12.1	ND ^b	13.5	ND ^a	ND ^a	ND ^c	55.2
	000829-042	2708-S076	29-Aug-00	11.5	1.07	2.67	ND ^a	ND ^a	13.9	17.6	14.6	2.	14.7	ND ^a	ND ^a	ND ^c	53.
	000829-043	2708-S076	29-Aug-00	11.5 (dup)	ND ^a	3.33	ND ^a	ND ^a	15.1	19.4	11.9	ND ^b	12.2	ND ^a	ND ^a	ND ^c	52.5
	000829-045	2708-S076	29-Aug-00	31.0	-	-	-	-	-	-	-	-	-	-	-	-	-
B-48	000828-030	2708-S071	28-Aug-00	0.2	1.57	ND ^a	ND ^a	ND ^a	5.01	12.9	3.78	ND ^b	5.44	ND ^a	ND ^a	ND ^c	54.4
	000828-031	2708-S073	28-Aug-00	5.0	1.03	ND ^a	ND ^a	ND ^a	8.86	9.23	18.3	ND ^b	11.1	ND ^a	ND ^a	ND ^c	43.4
	000828-032	2708-S073	28-Aug-00	9.5	-	-	-	-	-	-	-	-	-	-	-	-	-
B-49	000828-036	2708-S071	28-Aug-00	0.2	1.62	ND ^a	ND ^a	ND ^a	9.26	9.62	6.93	ND ^b	4.7	ND ^a	ND ^a	ND>100	63.9
	000828-037	2708-S074	28-Aug-00	1.5	1.54	ND ^a	ND ^a	ND ^a	10.6	9.9	6.68	ND ^b	6.9	ND ^a	ND ^a	ND ^c	53.
	000828-038	2708-S074	28-Aug-00	8.0	-	-	-	-	-	-	-	-	-	-	-	-	-
B-50	000828-033	2708-S071	28-Aug-00	0.2	1.87	1.11	ND ^a	ND ^a	11.9	16.7	10.8	ND ^b	5.92	ND ^c	ND ^c	ND>100	67.2
	000828-034	2708-S073	28-Aug-00	1.0	1.52	ND ^a	ND ^a	ND ^a	10.2	10.7	11.1	ND ^b	8.65	ND ^a	ND ^a	ND ^c	62.6
	000828-035	2708-S073	28-Aug-00	6.0	1.59	ND ^a	ND ^a	ND ^a	10.	10.4	12.6	ND ^b	10.1	ND ^a	ND ^a	ND>100	61.4
B-51	000828-023	2708-S071	28-Aug-00	0.2	2.26	3.14	ND ^a	ND ^a	70.9	34.7	30.4	ND ^b	146.	ND ^a	ND ^a	ND ^c	114.
	000828-024	2708-S073	28-Aug-00	2.0	ND ^a	2.57	ND ^a	ND ^a	12.9	11.	2.4	ND ^b	14.8	ND ^a	ND ^a	ND ^c	ND ^a
	000828-025	2708-S073	28-Aug-00	8.5	-	-	-	-	-	-	-	-	-	-	-	-	-
EPA PRGs for Industrial Soil ¹					820.	2.7	2,200.	810.	450.	76,000.	750.	610.	41,000.	10,000.	10,000.	130.	100,000.

NOTE: bgs = below ground surface
dup = field duplicate sample
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams per kilogram

ND = Not detected above detection limit indicated
ppm = parts per million
1 = Reference Levels are EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil, updated November 2000
= Reference level not established

a = detection limit is 1.00 mg/kg (ppm)
b = detection limit is 0.100 mg/kg
c = detection limit is 10 mg/kg
Bold = Detected above Reference Levels

**TABLE 5 - Summary of Analytical Results for Soil Samples
Priority Pollutant Metals by EPA Methods 6010 and 7471**

Supplemental Soil Quality Investigation
NW Natural - Gasco Facility
Portland, Oregon

Project No. 2708

Total Metals by EPA Method 6010 and 7471					Analytical Results mg/kg (ppm)												
Soil Boring	Sample Number (Prefix: 2708-)	Chain of Custody Number	Sample Date	Sample Depth (feet bgs)	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
B-52	000828-026	2708-S071	28-Aug-00	0.2	ND ^a	ND ^a	ND ^a	ND ^a	ND ^a	3.83	4.01	ND ^b	3.78	ND ^a	ND ^a	ND ^a	28.4
	000828-027	2708-S073	28-Aug-00	3.5	ND ^a	2.54	ND ^a	ND ^a	11.8	11.8	1.78	ND ^b	14.3	ND ^a	ND ^a	ND ^a	35.9
	000828-028	2708-S073	28-Aug-00	10.5	-	-	-	-	-	-	-	-	-	-	-	-	-
	000828-029	2708-S073	28-Aug-00	10.5 (dup)	-	-	-	-	-	-	-	-	-	-	-	-	-
SS-12	000829-061	2708-S075	29-Aug-00	0.2	ND ^a	ND ^a	ND ^a	ND ^a	5.55	21.7	3.74	ND ^b	4.89	ND ^a	ND ^a	ND ^a	45.9
SS-13	000829-062	2708-S075	29-Aug-00	0.2	ND ^a	ND ^a	ND ^a	ND ^a	1.07	6.24	1.23	ND ^b	ND ^a	ND ^a	ND ^a	ND ^a	32.7
SS-14	000829-063	2708-S075	29-Aug-00	0.2	1.34	ND ^a	ND ^a	ND ^a	3.21	5.41	4.17	ND ^b	2.08	ND ^a	ND ^a	ND ^a	55.1
SS-15	000829-064	2708-S075	29-Aug-00	0.2	1.13	3.34	ND ^a	ND ^a	4.94	11.	132.	0.578	5.78	ND ^a	ND ^a	ND ^a	58.5
	000829-065	2708-S075	29-Aug-00	0.2 (dup)	ND ^a	ND ^a	ND ^a	ND ^a	5.47	6.73	4.33	ND ^b	3.02	ND ^a	ND ^a	ND ^a	37.9
EPA PRGs for Industrial Soil ¹					820.	2.7	2,200.	810.	450.	76,000.	750.	610.	41,000.	10,000.	10,000.	130.	100,000.

NOTE: bgs = below ground surface
dup = field duplicate sample
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams per kilogram

ND = Not detected above detection limit indicated
ppm = parts per million
1 = Reference Levels are EPA Region 9 Preliminary Remediation Goals (PRGs) for Industrial Soil, updated November 2000
= Reference level not established

a = detection limit is 1.00 mg/kg (ppm)
b = detection limit is 0.100 mg/kg
c = detection limit is 10 mg/kg
Bold = Detected above Reference Levels

TABLE 6 - Summary of Analytical Results for Soil Samples: Physical Parameters

Supplemental Soil Quality Investigation
 NW Natural - Gasco Facility
 Portland, Oregon

Project No. 2708

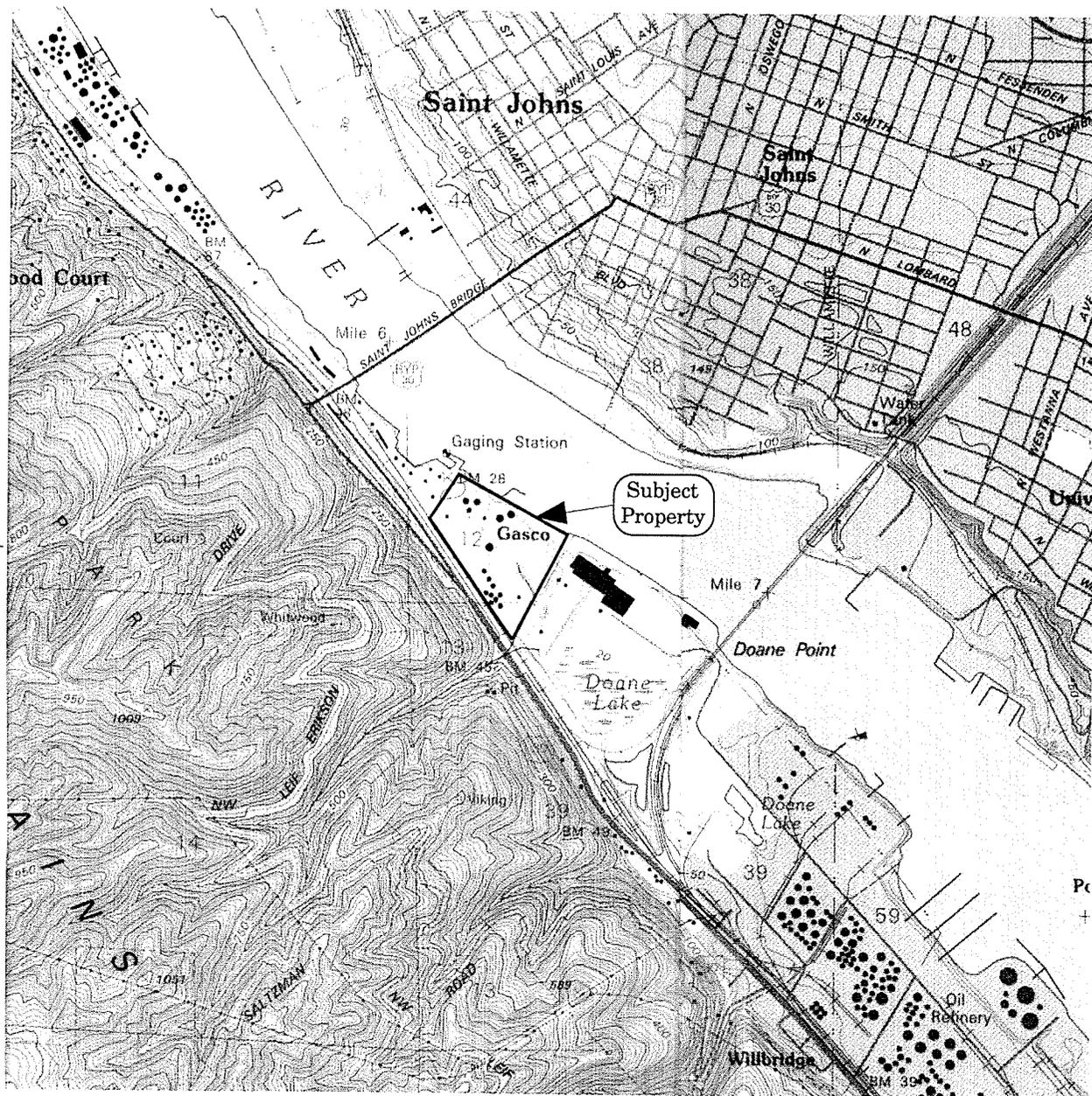
Soil Boring Number	Sample Number ¹	Chain of Custody Number	Sample Date	Depth (feet bgs)	Soil Description (surficial fill unit unless otherwise noted)	Analytical Results					
						EPA Method 160.3M	ASTM Method D4129-82M	ASTM Method E1109-86	ASTM Method D854-83	ASA Method 921-2.2	
						Total Solids (%)	TOC (%)	Density (g/cm ³)	Specific Gravity	Porosity (% Pore Space)	
B-36	000828-019	2708-S073	28-Aug-00	10.0	Sandy Gravelly Silt	80.4	-	1.28	1.79	30.	
B-37	000828-003	2708-S072	28-Aug-00	11.0	Sand	94.6	0.22	1.13	2.22	49.	
B-38	000828-016	2708-S072	28-Aug-00	8.5	Gravelly Silt	79.3	5.23	1.03	1.74	41.	
B-39	000828-006	2708-S072	28-Aug-00	9.5	Sand	90.	0.18	-	-	-	
B-40	000828-012	2708-S072	28-Aug-00	9.5	Silt (Alluvial)	75.3	0.8	-	-	-	
B-41	000828-009	2708-S072	28-Aug-00	9.5	Sand (Alluvial)	89.9	0.45	1.04	1.89	45.	
B-42	000828-022	2708-S073	28-Aug-00	7.5	Sand	90.	0.39	1.06	1.87	43.	
B-43	000829-048	2708-S076	29-Aug-00	8.5	Sand	93.1	1.49	-	-	-	
B-44	000829-053	2708-S076	29-Aug-00	10.0	Tarry Sand and Gravel	85.5	42.	-	-	-	
B-45	000829-057	2708-S077	29-Aug-00	8.5	Sand	93.4	3.85	-	-	-	
B-46	000829-059	2708-S077	29-Aug-00	6.0	Sand	93.7	0.26	1.17	2.04	43.	
B-47	000829-042	2708-S076	29-Aug-00	11.5	Silty Sand	83.	0.35	1.04	1.8	42.	
	000829-043	2708-S076	29-Aug-00	11.5 (dup)	Silty Sand	79.7	1.21	-	-	-	
	000829-045	2708-S076	29-Aug-00	31.0	Sand (Alluvial)	84.6	2.47	-	-	-	
B-48	000828-082	2708-S073	28-Aug-00	9.5	Tarry Sandy Gravel	81.7	17.9	-	-	-	
B-49	000828-037	2708-S074	28-Aug-00	1.5	Sandy Silty Gravel	87.7	4.56	-	-	-	
B-50	000828-035	2708-S073	28-Aug-00	6.0	Tarry Silty Sandy Gravel	76.2	27.9	1.01	1.56	35.	
B-51	000828-025	2708-S073	28-Aug-00	8.5	Sand	92.6	0.85	1.05	2.	47.	
B-52	000828-028	2708-S073	28-Aug-00	10.5	Sand	82.6	0.44	-	-	-	
	000828-029	2708-S073	28-Aug-00	10.5 (dup)	Sand	63.2	-	1.32	1.37	4.	

NOTE: ASA = American Standards Association
 ASTM = American Society of Testing Materials
 bgs = below ground surface

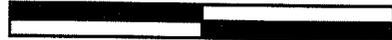
dup = field duplicate sample
 EPA = U.S. Environmental Protection Agency
 TOC = total organic carbon
 g/cm³ = gram per cubic centimeter

1 = Sample number prefix: 2708-

FIGURES



0 2,000 4,000



Scale in Feet
Contour Interval = 10 feet



Note: Base Map from Linnton (1990) and Portland (1990), Oregon, USGS 7.5 Minute Quadrangles

Project
No. 2708

**HAHN AND ASSOCIATES
INCORPORATED**

ENVIRONMENTAL MANAGEMENT
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LOCATION MAP

NW Natural
Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

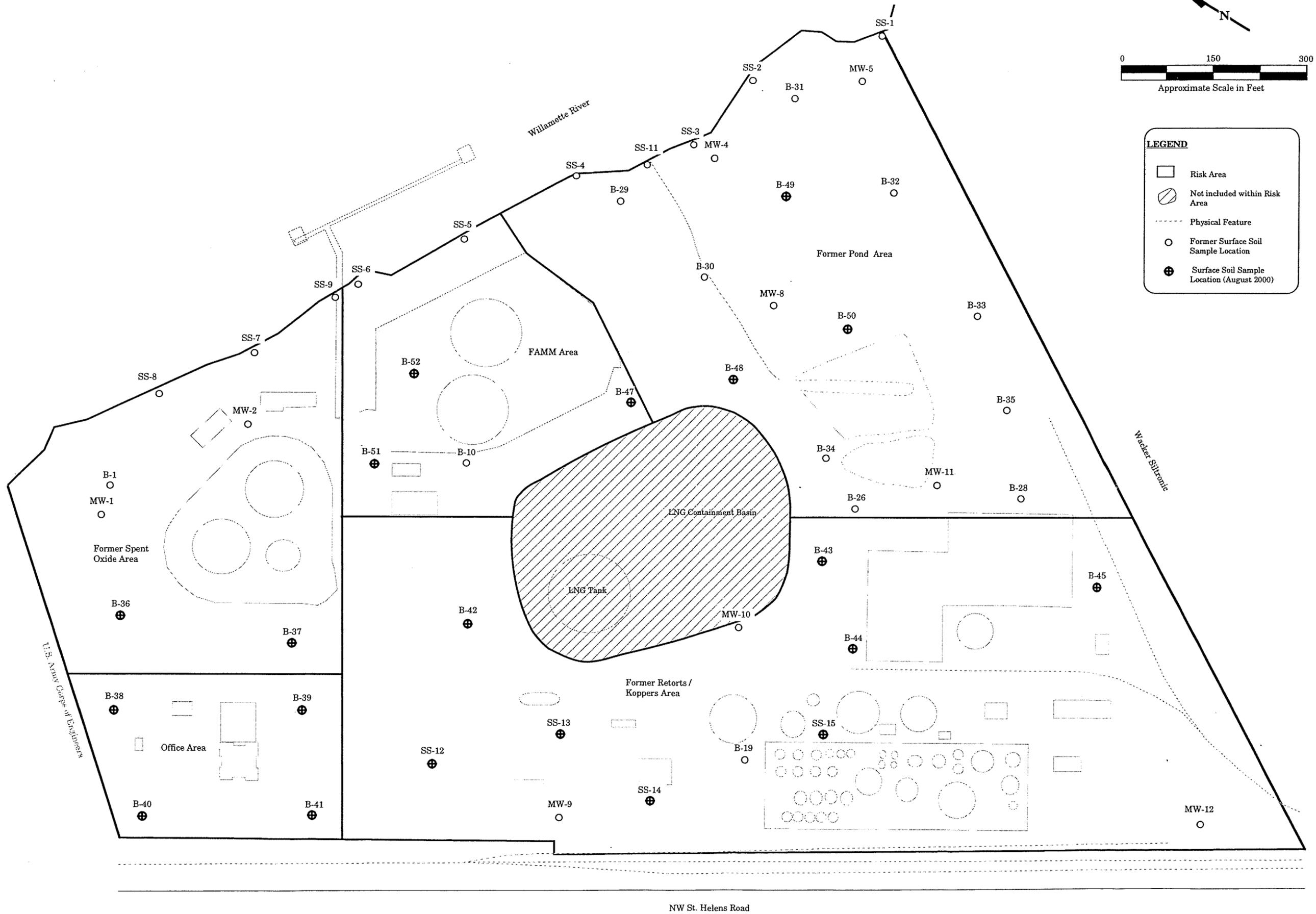
FIGURE

1

April
2001

Figure

2



Soil Sample Location Map: Surface Soils (0-0.2 feet bgs)

Supplemental Soil Investigation
NW Natural - Gasco Facility
7900 NW St. Helens Road
Portland, Oregon

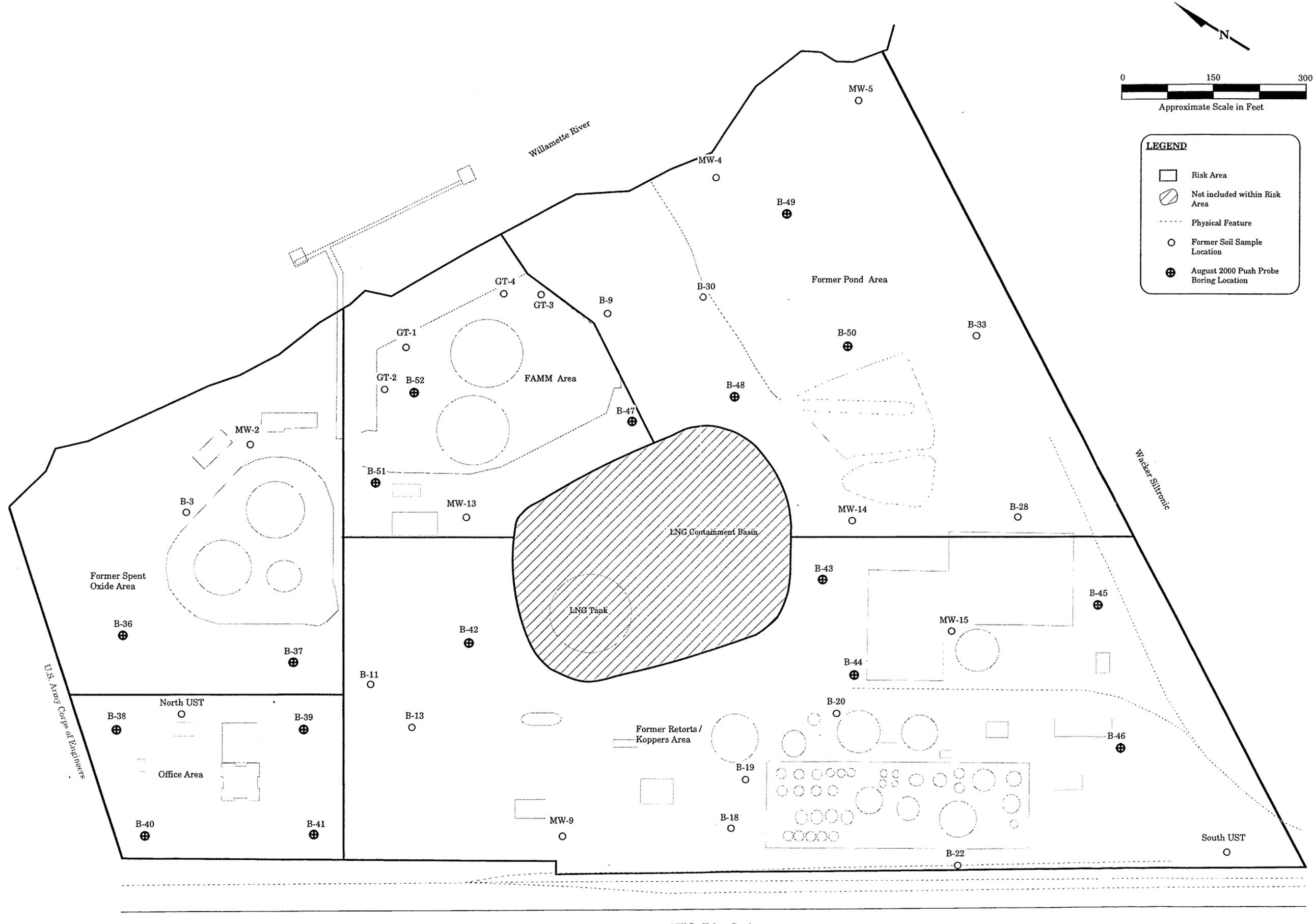
HAHN & ASSOCIATES, INC.

ENVIRONMENTAL MANAGEMENT
434 NW SIXTH AVENUE, SUITE 203
PORTLAND, OREGON 97209
503/796-0717

February
2001

Project #2708

Figure 3



**Soil Sample Location Map: Subsurface Soils
(1 - 12 feet below ground surface)**

Supplemental Soil Investigation
 NW Natural - Gasco Facility
 7900 NW St. Helens Road
 Portland, Oregon

HAHN & ASSOCIATES, INC.

ENVIRONMENTAL MANAGEMENT
 434 NW SIXTH AVENUE, SUITE 203
 PORTLAND, OREGON 97209
 503/796-0717

February
 2001

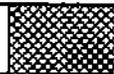
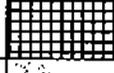
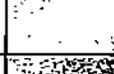
Project #2708

NW St. Helens Road

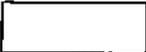
APPENDIX A
SOIL BORING LOGS

KEY TO BORING LOGS

Soil classification in this report is based upon visual and manual field observations which include moisture, consistency, plasticity and grading estimates and should not be construed to imply field or laboratory testing unless presented herein. Soils are classified in accordance with the Unified Soil Classification System. Stratigraphic boundaries are approximate representations only. No warranty is provided as to the continuity of soil strata between borings.

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)					
MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES	
COURSE GRAINED SOILS More Than Half is Larger Than #200 Sieve	GRAVELS More Than Half the Course Fraction is Larger Than No. 4 Sieve Size	Clean Gravels With Little or No Fines	GW		Well Graded Gravels, Gravel-Sand Mixtures
		Gravels With Over 12% Fines	GP		Poorly Graded Gravels, Gravel-Sand Mixtures
		Gravels With Over 12% Fines	GM		Silty Gravels, Poorly Graded Gravel-Sand-Silt Mixtures
		Gravels With Over 12% Fines	GC		Clayey Gravels, Poorly Graded Gravel-Sand-Clay Mixtures
	SANDS More Than Half the Course Fraction is Smaller Than No. 4 Sieve Size	Clean Sands With Little or No Fines	SW		Well Graded Sands, Gravelly Sands
		Sands With Over 12% Fines	SP		Poorly Graded Sands, Gravelly Sands
		Sands With Over 12% Fines	SM		Silty Sands, Poorly Graded Sand-Silt Mixtures
		Sands With Over 12% Fines	SC		Clayey Sands, Poorly Graded Sand-Clay Mixtures
FINE GRAINED SOILS More Than Half is Smaller Than #200 Sieve	SILTS AND CLAYS Liquid Limit Less Than 50%		ML		Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands, or Clayey Silts with Slight Plasticity
	SILTS AND CLAYS Liquid Limit Less Than 50%		CL		Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
	SILTS AND CLAYS Liquid Limit Less Than 50%		OL		Organic Clays and Organic Silty Clays of Low Plasticity
	SILTS AND CLAYS Liquid Limit Greater Than 50%		MH		Inorganic Silts, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silts
	SILTS AND CLAYS Liquid Limit Greater Than 50%		CH		Inorganic Clays of High Plasticity, Fat Clays
	SILTS AND CLAYS Liquid Limit Greater Than 50%		OH		Organic Clays of Medium to High Plasticity, Organic Silts
HIGHLY ORGANIC SOILS			Pt		Peat and Other Highly Organic Soils

LEGEND FOR BORING LOGS

	Blank Casing
	Slotted Screen
	Cement Grout
	Concrete
	Bentonite
	Sand Pack
	Fill Material

ABBREVIATIONS

NA	Not Applicable
ND	Not Detected Above Detection Limit
NS	Not Sampled
PAH	Polynuclear Aromatic Hydrocarbons
ppb	Parts Per Billion
SPT	Standard Penetration Test
	Measured Static Water Level in Well
	Estimated Water Level During Drilling

HARN & ASSOCIATES, INC.

434 NW Sixth Avenue

Portland, Oregon

(503) 796-0717

SOIL BORING NUMBER

B-36

PROJECT:

NW Natural

Gasco Facility

Portland, Oregon

PROJECT #: 2708

HAI LOGGER:

Rob Ede

SAMPLING METHOD:

Stainless Steel Soil Sampler with PVC Sleeve

DRILLING METHOD:

Hydraulic Push Soil Probe

EQUIPMENT TYPE

Geo-Probe

DRILLER:

Marcus Johnson

DRILLING CONTRACTOR:

Geo-Tech Explorations, Inc.

DRILL

START

Time:

12:28

Date:

08/28/00

DRILL

FINISH

Time:

13:05

Date:

08/28/00

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppb)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	BORING DIAMETER: 1.5-inch	
										CASING DIAMETER: Not Applicable	
										SURFACE ELEVATION: 36.71feet msl	
										TOP OF CASING ELEVATION: Not Applicable	
										SOIL DESCRIPTION	
	-017	12:28	-	11,090	↑	↑	1			Surface: Silty Gravel	
							2		ML	Sandy SILT - brown, dry, soft, non-plastic, visible lampblack mixed throughout, pieces of brick from 3.5 to 4.0 feet below ground surface (bgs), no sheen, no hydrocarbon odor	
							3				
	-018	12:45	7.9	1,160	↓	↓	4			SILT - grey, moist, soft, non-plastic, no sheen, no hydrocarbon odor (4 to 5 feet bgs)	
							5				
							6			Gravelly SAND - black, moist, no sheen, material looks like weathered and broken asphalt (5 to 8 feet bgs)	
							7		SP		
							8				
							9			Sandy Gravelly SILT - olive grey, very moist, soft, pieces of brick are present, no sheen, no hydrocarbon odor (8 to 12 feet bgs)	
							10		ML		
	-019	13:05	-	635.0	↓	↓	11				
							12				
							13				
							14				
							15			Boring terminated at 12.0 feet bgs.	
							16			*Sample prefix is 2708-000828-	
							17				
							18				
							19				
							20				

HAHN & ASSOCIATES, INC.

434 NW Sixth Avenue

Portland, Oregon

(503) 796-0717

SOIL BORING NUMBER

B-37

PROJECT:

NW Natural

Gasco Facility

Portland, Oregon

PROJECT #: 2708

HAI LOGGER:

Rob Ede

SAMPLING METHOD:

Stainless Steel Soil Sampler with PVC Sleeve

DRILLING METHOD:

Hydraulic Push Soil Probe

EQUIPMENT TYPE:

Geo-Probe

DRILLER:

Marcus Johnson

DRILLING CONTRACTOR:

Geo-Tech Explorations, Inc.

DRILL

START

Time:

9:05

Date:

08/28/00

DRILL

FINISH

Time:

9:35

Date:

08/28/00

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppb)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	BORING DIAMETER: 1.5-inch	
										CASING DIAMETER: Not Applicable	
										SURFACE ELEVATION: 36.64 feet msl	
										TOP OF CASING ELEVATION: Not Applicable	
										SOIL DESCRIPTION	
	-001	9:04	-	63,855	↑	↑	1		SP	Surface: Silty Gravel	
							2			SAND - brown, dry, becoming moist at 4 feet bgs, loose, fine-grained, no sheen, no hydrocarbon odor (0 to 12 feet below ground surface (bgs))	
							3				
							4				
	-002	9:20	11.4	3,705	↑	↑	5				
							6				
							7				
							8				
							9				
							10				
	-003	9:30	4.6	ND	↓	↓	12				
							13			Boring terminated at 12.0 feet bgs.	
							14		*Sample prefix is 2708-000828.		
							15				
							16				
							17				
							18				
							19				
							20				

HAHN & ASSOCIATES, INC.

434 NW Sixth Avenue
Portland, Oregon

(503) 796-0717

SOIL BORING NUMBER

B-38

PROJECT:

NW Natural
Gasco Facility
Portland, Oregon

PROJECT #: 2708

HAI LOGGER:

Rob Ede

SAMPLING METHOD:

Stainless Steel Soil Sampler with PVC Sleeve

DRILLING METHOD:

Hydraulic Push Soil Probe

EQUIPMENT TYPE

Geo-Probe

DRILLER:

Marcus Johnson

DRILLING CONTRACTOR:

Geo-Tech Explorations, Inc.

DRILL

START

Time:

12:00

Date:

08/28/00

DRILL

FINISH

Time:

12:20

Date:

08/28/00

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppb)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	BORING DIAMETER:	1.5-inch
										CASING DIAMETER:	Not Applicable
										SURFACE ELEVATION:	36.66 feet msl
										TOP OF CASING ELEVATION:	Not Applicable
										SOIL DESCRIPTION	
Bentonite Chips	-014	12:00	-	19,180	↑	↑	1			Surface: Silty Sandy Gravel, dry, brown, hard, grass covered	
							2			Sandy Silty GRAVEL - brown, moist, contains brick fragments and lampblack, no sheen, strong hydrocarbon or organic odor (0 to 3.0 feet below ground surface (bgs))	
								3	GM		
		-015	12:05	8.8	10,400	↓	↓	4			
								5			
								6		SILT - brown with tan and orange mottling, moist, stiff, non plastic, rootlets present, no sheen, no hydrocarbon odor (4.5 to 6.5 feet bgs)	
								7	ML		
								8			
		-016	12:15	-	720	↑	↑	9		Gravelly SILT - olive grey, very moist to wet, very soft, slightly plastic, rootlets present, potential lampblack present, strong potential hydrocarbon odor (8.0 to 10.0 feet bgs)	
								10			
								11			
								12			
							13				
							14				
							15		Boring terminated at 12.0 feet bgs.		
							16		*Sample prefix is 2708-000828-		
							17				
							18				
							19				
							20				

HAHN & ASSOCIATES, INC.

434 NW Sixth Avenue
 Portland, Oregon
 (503) 796-0717

SOIL BORING NUMBER

B-39

PROJECT:

NW Natural
 Gosco Facility
 Portland, Oregon

HAI LOGGER:

Rob Ede

SAMPLING METHOD:

Stainless Steel Soil Sampler with PVC Sleeve

DRILLING METHOD:

Hydraulic Push Soil Probe

EQUIPMENT TYPE

Geo-Probe

DRILLER:

Marcus Johnson

DRILLING CONTRACTOR:

Geo-Tech Explorntions, Inc.

DRILL

START

Time:
9:50

Date:
08/28/00

DRILL

FINISH

Time:
10:05

Date:
08/28/00

PROJECT #: 2708

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppb)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	BORING DATA	
										BORING DIAMETER:	1.5-inch
										SURFACE ELEVATION: 36.71 feet msl	
										TOP OF CASING ELEVATION: Not Applicable	
										SOIL DESCRIPTION	
	-004	9:50	-	11,570	↑	↑	1			Surface: Silt and Gravel, brown, dry, hard, grass covered	
							2		GM	Silty Gravelly SAND - brown, dry becoming moist at 3 feet below ground surface (bgs), pieces of concrete throughout, no sheen, no hydrocarbon odor (0 to 4.5 feet bgs)	
							3				
	-005	9:55	8.6	ND	↓	↓	4				
							5				
							6		SP	SAND - brown, very moist, fine grained, dense, poorly graded, 1.5-inch diameter basalt fragment at 9 feet bgs, no sheen, no hydrocarbon odor (4.5 to 12 feet bgs)	
							7				
							8				
							9				
	-006	10:05	8.1	ND	↓	↓	10				
							11				
							12				
							13				
							14				
							15				
							16				
							17				
							18				
							19				
							20				

Boring terminated at 12.0 feet bgs.

*Sample prefix is 2708-000828-

HAHN & ASSOCIATES, INC.

434 NW Sixth Avenue
 Portland, Oregon
 (503) 796-0717

SOIL BORING NUMBER

B-40

PROJECT:

NW Natural
 Gasco Facility
 Portland, Oregon

PROJECT #: 2708

HAI LOGGER:

Rob Ede

SAMPLING METHOD:

Stainless Steel Soil Sampler with PVC Sleeve

DRILLING METHOD:

Hydraulic Push Soil Probe

EQUIPMENT TYPE

Geo-Probe

DRILLER:

Marcus Johnson

DRILLING CONTRACTOR:

Geo-Tech Explorations, Inc.

DRILL START

Time: 10:55

Date: 08/28/00

DRILL FINISH

Time: 11:35

Date: 08/28/00

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppb)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	BORING DIAMETER: 1.5-inch		
										CASING DIAMETER: Not Applicable		
										SURFACE ELEVATION: 37.21 feet msl		
										TOP OF CASING ELEVATION: Not Applicable		
										SOIL DESCRIPTION		
Bentonite Chips	-010	11:00	-	56,155	↑	↑	1		SP	Surface: Silty Gravel, brown, dry, grass covered		
							2			SAND - brown, dry, becoming moist at 2 feet below ground surface (bgs), fine grained, poorly graded, no sheen, no hydrocarbon odor (0 to 6.5 feet bgs)		
							3					
		-011	11:06	18.6	ND	↓	↓	4				
						↑	↑	5				
								6				
								7		ML	SILT - grey and orange mottled, slightly moist, non-plastic, stiff, rootlets, with oxidized discoloration along rootlets, no hydrocarbon odor, no sheen (6.5 to 12 feet bgs)	
						↓	↓	8				
						↑	↑	9				
		-013	11:30	-	ND	↓	↓	10				
								11				
								12				
							13					
							14					
							15					
							16					
							17					
							18					
							19					
							20					

Boring terminated at 12.0 feet bgs.

*Sample prefix is 2708-000828-

HAHN & ASSOCIATES, INC.

434 NW Sixth Avenue

Portland, Oregon

(503) 796-0717

SOIL BORING NUMBER

B-41

PROJECT:

NW Natural

Gasco Facility

Portland, Oregon

PROJECT #: 2708

HAI LOGGER:

Rob Ede

SAMPLING METHOD:

Stainless Steel Soil Sampler with PVC Sleeve

DRILLING METHOD:

Hydraulic Push Soil Probe

EQUIPMENT TYPE

Geo-Probe

DRILLER:

Marcus Johnson

DRILLING CONTRACTOR:

Geo-Tech Explorations, Inc.

DRILL

START

Time:

10:10

DRILL

FINISH

Time:

10:55

Date:

08/28/00

Date:

08/28/00

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppb)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	BORING DIAMETER: 1.5-inch	
										CASING DIAMETER: Not Applicable	
										SURFACE ELEVATION: 36.91 feet msl	
										TOP OF CASING ELEVATION: Not Applicable	
										SOIL DESCRIPTION	
Bentonite Chips	-007	10:10	-	27,285	↑	↑	1		GM	Surface: Silt and Gravel, brown, dry, hard, grass covered	
							2			Silty Sandy GRAVEL - brown, dry, concrete fragments at 2 feet below ground surface (bgs), no sheen, no hydrocarbon odor (0 to 3.0 feet bgs)	
	-008	10:30	8.6	26,430	↓	↓	3		ML	Clayey SILT - grey, wet, soft, plastic, organic rootlet material, no sheen, no hydrocarbon odor (4.5 to 5 feet bgs)	
							4			SAND - brown, moist, fine grained, dense, poorly graded, becomes orange-rust colored from 10 to 12 feet bgs, no sheen, no hydrocarbon odor (5 to 12 feet bgs)	
							5		SP		
							6				
							7				
							8				
							9				
	-009	10:39	7.8	ND	↓	↓	10				
							11				
							12			Boring terminated at 12.0 feet bgs.	
						13			*Sample prefix is 2708-000828-		
						14					
						15					
						16					
						17					
						18					
						19					
						20					

Hahn & Associates, Inc.

434 NW Sixth Avenue
 Portland, Oregon
 (503) 796-0717

SOIL BORING NUMBER

B-43

PROJECT:

NW Natural
 Gasco Facility
 Portland, Oregon

PROJECT #: 2708

HAI LOGGER:

Rob Ede

SAMPLING METHOD:

Stainless Steel Soil Sampler with PVC Sleeve

DRILLING METHOD:

Hydraulic Push Soil Probe

EQUIPMENT TYPE

Geo-Probe

DRILLER:

Marcus Johnson

DRILLING CONTRACTOR:

Geo-Tech Explorations, Inc.

DRILL

START

Time:

10:45

Date:

08/29/00

DRILL

FINISH

Time:

10:55

Date:

08/29/00

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppb)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	BORING DIAMETER: 1.5-inch	
										CASING DIAMETER: Not Applicable	
										SURFACE ELEVATION: 35.67 feet msl	
										TOP OF CASING ELEVATION: Not Applicable	
										SOIL DESCRIPTION	
Bentonite Chips	-050	10:55	-	331,605	↑	↑	1		SP	Surface: Gravel, mixed with much apparent pencil pitch from nearby Koppers Industries, Inc. storage area	
							2			SAND - grey, slightly moist, fine grained, dense, poorly graded, orange oxidation color below 4 feet below ground surface (bgs) no sheen, no hydrocarbon odor (0 to 12 feet bgs)	
	-046	10:48	0.8	10,835			3				
	-047	10:50	(dup)	4,235			4				
							5				
							6				
							7				
							8				
	-048	10:55	9.2	57,105	↑	↑	9				
	-049	10:56	(dup)	316,600			10				
							11				
							12				
						13					
						14					
						15					
						16					
						17					
						18					
						19					
						20					

Boring terminated at 12.0 feet bgs.
 *Sample prefix is 2708-000829-

HAHN & ASSOCIATES, INC.

434 NW Sixth Avenue
Portland, Oregon
(503) 796-0717

SOIL BORING NUMBER

B-44

PROJECT:

NW Natural
Gasco Facility
Portland, Oregon

PROJECT #: 2708

HAI LOGGER:

Rob Ede

SAMPLING METHOD:

Stainless Steel Soil Sampler with PVC Sleeve

DRILLING METHOD:

Hydraulic Push Soil Probe

EQUIPMENT TYPE

Geo-Probe

DRILLER:

Marcus Johnson

DRILLING CONTRACTOR:

Geo-Tech Explorations, Inc.

DRILL START

Time: 11:15

Date: 08/29/00

DRILL FINISH

Time: 11:50

Date: 08/29/00

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppb)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	BORING DIAMETER: 1.5-inch		
										CASING DIAMETER: Not Applicable		
										SURFACE ELEVATION: 35.93 feet msl		
										TOP OF CASING ELEVATION: Not Applicable		
										SOIL DESCRIPTION		
Bentonite Chips	-052	11:30	-	99,950	↑	↑	1			Surface: Asphalt, 2-inches thick, surface sample collected immediately beneath asphalt		
							2			SP	SAND - brown, slightly moist, fine grained, dense, poorly graded, no sheen, no hydrocarbon odor (0 to 3.5 feet below ground surface (bgs))	
							3					
							4					
		-051	11:25	800	8,460	↓	↓	4			GM	Tarry SAND and GRAVEL - brown and black, slightly moist, dense, lampblack throughout, 3-inch tar layer at 6 feet bgs, tar is black, solid, plastic (5.0 to 12.0 feet bgs)
							5					
							6					
							7					
							8					
							9					
		-053	11:45	159	62,405	↓	↓	10				
								11				
							12					
							13					
							14					
							15					
							16					
							17					
							18					
							19					
							20					

Boring terminated at 12.0 feet bgs.
*Sample prefix is 2708-000829-

HAHN & ASSOCIATES, INC.

434 NW Sixth Avenue
 Portland, Oregon
 (503) 796-0717

SOIL BORING NUMBER

B-45

PROJECT:

NW Natural
 Gasco Facility
 Portland, Oregon

PROJECT #: 2708

HAI LOGGER:

Rob Ede

SAMPLING METHOD:

Stainless Steel Soil Sampler with PVC Sleeve

DRILLING METHOD:

Hydraulic Push Soil Probe

EQUIPMENT TYPE

Geo-Probe

DRILLER:

Marcus Johnson

DRILLING CONTRACTOR:

Geo-Tech Explorations, Inc.

DRILL

START

Time:

12:00

Date:

08/29/00

DRILL

FINISH

Time:

12:20

Date:

08/29/00

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppb)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	BORING DIAMETER: 1.5-inch		
										CASING DIAMETER: Not Applicable		
										SURFACE ELEVATION: 35.23 feet msl		
										TOP OF CASING ELEVATION: Not Applicable		
										SOIL DESCRIPTION		
Bentonite Chips	-054	12:00	-	388,200	↑	↑	1		GP	Surface: Gravel roadbed adjacent to asphalt roadbed.		
							2		SP	Sandy GRAVEL - grey, dry, mixed with pencil pitch or lampblack throughout (black granular material), no sheen (0 to 1.5 feet below ground surface (bgs)).		
	-055	12:10	12.0	60			3		ML	SAND - brown, dry, fine grained, mixed with pencil pitch or lampblack in upper 3-inches, some brick fragments throughout, no sheen (1.5 to 2.0 feet bgs).		
	-056	12:10	(dup)	160			3			SILT - olive grey, moist, non-plastic, rootlets present, no odor, no sheen (2.0 to 4.5 feet bgs)		
							4					
							5					
							6				SAND - brown, moist, fine grained, no sheen, no petroleum hydrocarbon odor (4.0 to 11.5 feet bgs).	
							7					
							8					
							9			SP		
	-057	12:15	7.0	8,355	↑	↑	9					
							10					
						11						
						12						
						13						
						14						
						15				Boring terminated at 12.0 feet bgs.		
						16				*Sample prefix is 2708-000829-		
						17						
						18						
						19						
						20						

Hahn & Associates, Inc.

434 NW Sixth Avenue
 Portland, Oregon
 (503) 796-0717

SOIL BORING NUMBER

B-46

PROJECT:
 NW Natural
 Gasco Facility
 Portland, Oregon

HAI LOGGER: Rob Ede
SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve
DRILLING METHOD: Hydraulic Push Soil Probe
EQUIPMENT TYPE: Geo-Probe
DRILLER: Marcus Johnson
DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.

DRILL	DRILL
START	FINISH
Time:	Time:
12:35	13:30
Date:	Date:
08/29/00	08/29/00

PROJECT #: 2708

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppb)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	BORING DIAMETER: 1.5-inch
										CASING DIAMETER: Not Applicable
										SURFACE ELEVATION: 34.76 feet msl
										TOP OF CASING ELEVATION: Not Applicable
										SOIL DESCRIPTION

Bentonite Chips	-058	13:30	-	240,150	↑	↑	1		SP
							2		
							3		
							4		
							5		
	-059	13:15	11.0	3,135	↑	↑	6		
							7		
							8		
							9		
							10		
	-060	13:20	30.0	360	↑	↑	11		
							12		
							13		
							14		
							15		
							16		
							17		
							18		
							19		
							20		

Surface: Concrete sidewalk, 4 to 6-inches thick

SAND - brown, with black layers at 6-inches below ground surface (bgs), the other at 2.5 feet bgs. Black layers are approximately 1-inch thick and appear to be lampblack or pencil pitch, dry, fine grained, dense, poorly graded, no sheen, no hydrocarbon odor (0 to 3.5 feet bgs)

SAND - brown, dry, fine grained, dense, poorly graded, no sheen, no hydrocarbon odor (3.5 to 8.0 feet bgs)

SAND - brown with some thin gray layering, moist, becoming wet at 10.5 feet bgs, fine grained, poorly graded, strong rainbow sheen within wet zone, strong hydrocarbon odor, no observable product, wood fragment at base of core (8.0 to 11.5 feet bgs)

Boring terminated at 12.0 feet bgs.

*Sample prefix is 2708-000829-

HAHN & ASSOCIATES, INC.

434 NW Sixth Avenue
 Portland, Oregon
 (503) 796-0717

SOIL BORING NUMBER

B-47

PROJECT:

NW Natural
 Gasco Facility
 Portland, Oregon

PROJECT #: 2708

HAI LOGGER:

Rob Ede

SAMPLING METHOD:

Stainless Steel Soil Sampler with PVC Sleeve

DRILLING METHOD:

Hydraulic Push Soil Probe

EQUIPMENT TYPE

Geo-Probe

DRILLER:

Marcus Johnson

DRILLING CONTRACTOR:

Geo-Tech Explorations, Inc.

DRILL

START

Time:

8:15

Date:

08/29/00

DRILL

FINISH

Time:

10:00

Date:

08/29/00

ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppb)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	BORING DIAMETER: 1.5-inch	
										CASING DIAMETER: Not Applicable	
										SURFACE ELEVATION: 34.95 feet msl	
										TOP OF CASING ELEVATION: Not Applicable	
										SOIL DESCRIPTION	
Bentonite Chips							21			SP	
							22				
							23				
							24				SAND - dark grey, wet, medium grained, poorly graded, moderate sheen and hydrocarbon odor at 23 feet bgs, immediately above an approximate 6-inch thick layer of lampblack from 23 to 23.5 feet bgs (22.5 to 23.5 feet bgs).
							25				
							26				SAND - dark grey, wet, medium grained, poorly graded, few shell fragments and gravels, slight sheen and hydrocarbon odor (23.5 to 30 feet bgs).
							27				
							28				
							29				
							30				
						31			SAND - as above, but no sheen (30 to 31.5 feet bgs).		
	-045	9:55	10.3	181			32				
							33				
							34			Boring terminated at 32.0 feet bgs.	
							35			*Sample prefix is 2708-000829.	
							36				
							37				
							38				
							39				
							40				

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717					SOIL BORING NUMBER B-49				
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708					HAI LOGGER: Rob Ede			DRILL START	DRILL FINISH
					SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve			Time: 16:30	Time: 17:20
					DRILLING METHOD: Hydraulic Push Soil Probe			Date: 08/28/00	Date: 08/28/00
					EQUIPMENT TYPE: Geo-Probe				
					DRILLER: Marcus Johnson				
					DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.				
ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHS (ppb)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)
	-036	16:40	-	-			1		
	-037	16:45	36.4	562,100			2		
							3		
							4		
							5		
							6		
							7		
							8		
	-038	17:00	14.7	3,992			9		
							10		
							11		
							12		
							13		
							14		
							15		
							16		
							17		
							18		
							19		
							20		

BORING DIAMETER: 1.5-inch
CASING DIAMETER: Not Applicable
SURFACE ELEVATION: 36.67 feet msl
TOP OF CASING ELEVATION: Not Applicable

SOIL DESCRIPTION

Surface: Gravel

Sandy Silty GRAVEL - brown and grey, dry, dense, several zones of lampblack, becoming tarry between 4 and 9 feet below ground surface (bgs).

GM

SILT - grey, wet, non-plastic, many rootlets and much organic debris, small amount of tar, hydrocarbon odor (9 to 9.5 feet bgs).

Refusal on hard substrate (cobble) at 11.5 feet bgs

ML

Boring terminated at 11.5 feet bgs.

*Sample prefix is 2708-000828-

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717					SOIL BORING NUMBER B-50					
PROJECT: NW Natural Gusco Facility Portland, Oregon					HAI LOGGER: Rob Ede			DRILL START	DRILL FINISH	
PROJECT #: 2708					SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve			Time: 15:45	Time: 16:20	
					DRILLING METHOD: Hydraulic Push Soil Probe			Date: 08/28/00	Date: 08/28/00	
					EQUIPMENT TYPE: Geo-Probe					
					DRILLER: Marcus Johnson					
					DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.					
ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppb)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	BORING DIAMETER: 1.5-inch
	-033	15:45	-	-			1		ML	Surface: Sandy Silt, brown, dry, grass covered
	-034	15:58	111	2,425			2		GM	Silty Sandy GRAVEL - brown and black, dry, dense, lamplblack throughout, becoming tarry below 1.0 foot below ground surface (bgs), tar content increases with depth, becoming a gravel in a tar matrix, becomes mostly tar below 8 feet bgs, tar is solid, soft, and ductile, hydrocarbon odor (0.5 to 12 feet bgs).
							3			
							4			
							5			
							6			
	-035	16:10	0.0	10,586			7			
							8			
							9			
							10			
							11			
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			
							20			

Boring terminated at 12.0 feet bgs.
*Sample prefix is 2708-000828-

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717				SOIL BORING NUMBER B-51							
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708				HAI LOGGER: Rob Ede		DRILL START	DRILL FINISH				
				SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve		Time: 13:45	Time: 14:15				
				DRILLING METHOD: Hydraulic Push Soil Probe		Date: 08/28/00	Date: 08/28/00				
				EQUIPMENT TYPE: Geo-Probe							
				DRILLER: Marcus Johnson							
				DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.							
ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppb)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	BORING DIAMETER:	1.5-inch
Bentonite Chips	-023	13:45	-	19,055	↑	↑	1		GP	Surface: Gravel road bed / parking area at surface, above a, approximate 4-inch thick concrete foundation.	
							2			SAND - brownmoist, fine-grained, poorly graded, no hydrocarbon odor, no sheen (1.0 to 12 feet bgs).	
	-024	14:00	16.3	-			3				
							4				
							5				
							6		SP		
							7				
							8				
	-025	14:10	11.2	-			9				
							10				
							11				
							12				
						13					
						14					
						15					
						16					
						17					
						18					
						19					
						20					

Boring terminated at 12.0 feet bgs.
*Sample prefix is 2708-000828-

HAHN & ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon (503) 796-0717					SOIL BORING NUMBER B-52					
PROJECT: NW Natural Gasco Facility Portland, Oregon PROJECT #: 2708					HAI LOGGER: Rob Ede			DRILL	DRILL	
					SAMPLING METHOD: Stainless Steel Soil Sampler with PVC Sleeve			START	FINISH	
					DRILLING METHOD: Hydraulic Push Soil Probe			Time:	Time:	
					EQUIPMENT TYPE: Geo-Probe			14:20	14:50	
					DRILLER: Marcus Johnson			Date:	Date:	
					DRILLING CONTRACTOR: Geo-Tech Explorations, Inc.			08/28/00	08/28/00	
ABANDONMENT DETAILS	SAMPLE NUMBER*	TIME	HEADSPACE (ppm)	LAB RESULTS TOTAL PAHs (ppb)	CORE INTERVAL	RECOVERY INTERVAL	DEPTH (feet)	GROUNDWATER	STRATA (USCS)	BORING DIAMETER: 1.5-inch
										CASING DIAMETER: Not Applicable
										SURFACE ELEVATION: 20.77 feet msl
										TOP OF CASING ELEVATION: Not Applicable
										SOIL DESCRIPTION
	-026	14:20	-	13,550	↑	↑	1		GP	Surface: Gravel road bed / parking area at surface
							2			SAND - brown, dry, fine-grained, poorly graded, no hydrocarbon odor, no sheen (0 to 7.5 feet below ground surface (bgs)).
							3			
	-027	14:30	46.7	-	↓	↓	4			
					↑	↑	5			SAND - grey, wet, fine-grained, poorly graded, slight hydrocarbon odor and sheen (7.5 to 11.5 feet bgs).
							6		SP	
							7			
					↓	↓	8			
					↑	↑	9			SANDY SILT - grey, wet, soft, non-plastic, no hydrocarbon odor, no sheen (11.5 to 12 feet bgs).
							10			
	-028	14:43	16.3	-			11			SANDY SILT - grey, wet, soft, non-plastic, no hydrocarbon odor, no sheen (11.5 to 12 feet bgs).
	-029	14:45	(dup)	-			12		ML	
							13			Boring terminated at 12.0 feet bgs. *Sample prefix is 2708-000828-
							14			
							15			
							16			
							17			
							18			
							19			
							20			

APPENDIX B
LABORATORY REPORTS AND CHAIN-OF-CUSTODY
DOCUMENTATION

HAHN AND ASSOCIATES, INC.
Environmental Management

434 NW Sixth Avenue, Suite 203 • Portland OR 97209
 (503) 796-0717 • Fax (503) 227-2209

Laboratory Environmental Services Laboratory, Inc.
 Portland, Oregon

CHAIN OF CUSTODY

Chain of Custody No. 2708-S071

Project Manager Rob Ede
Project No. 2708
Project Name NW Natural/Gasco; Surface
Collected by Rob Ede

Liquid with Sediment Sample
 Test Filtrate _____ Test Sedim Test Sediment _____ Test Both _____
Multi-Phase Sample
 Test One (which) _____ Test Separ Test Separately _____ Shake _____

Samples Received at 4C (Y or N) _____
 Appropriate Containers Used (Y or N) _____
 Provide Verbal Results (Y or N) No _____ Yes _____
 Provide Preliminary Fax Results Yes _____

Comments
 NOTE:
 All Normal TAT
 Prices as per Darwin to Ede Quote (August 2000)
 Receive approval from Rob Ede prior to disposing of any samples.

Lab ID	Sample #	Date	Time	Sample Description	Matrix		Analyzes to be Performed								Remarks	
					Soil	Water	Other	Number of Containers	PAHs (EPA 8270 SIM)	BTEX (EPA 8020)	Priority Pollutant Metals EPA 6010/7000	Total Organic Carbon (EPA 415.2)	Dry Bulk Density (ASTM D2937)	Specific Gravity/Porosity (ASTM D854/ASA# 21-2.2)		RUSH
01	2708-000828-001	28-Aug-00	9:04	B-37; surface	X			2	X							
04	2708-000828-004	28-Aug-00	9:50	B-39; surface	X			2	X							
07	2708-000828-007	28-Aug-00	10:10	B-41; surface	X			2	X							
010	2708-000828-010	28-Aug-00	11:00	B-40; surface	X			2	X							
014	2708-000828-014	28-Aug-00	12:00	B-38; surface	X			2	X							
017	2708-000828-017	28-Aug-00	12:28	B-36; surface	X			2	X							
020	2708-000828-020	28-Aug-00	13:15	B-42; surface	X			2	X							
023	2708-000828-023	28-Aug-00	13:45	B-51; surface	X			2	X							
026	2708-000828-026	28-Aug-00	14:20	B-52; surface	X			2	X							
030	2708-000828-030	28-Aug-00	15:05	B-48; surface	X			2	X							
033	2708-000828-033	28-Aug-00	15:45	B-50; surface	X			2	X							
036	2708-000828-036	28-Aug-00	16:40	B-49; surface	X			2	X							

Relinquished by Rob Ede Date 8/21/00 Time 10:40 Company HAI
 Received by [Signature] Date _____ Time _____ Company EJC

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Laboratory Environmental Services Laboratory, Inc.
 Portland, Oregon

CHAIN OF CUSTODY

Chain of Custody No. 2708-S072

Lab Project No. 0008163

Project Manager Rob Ede 2708	Project No. 2708	Project Name NW Natural/Gasce; Subsurface	Collected by Rob Ede
Liquid with Sediment Sample Test Filtrate _____ Test Sedim Test Sediment _____ Test Both _____ Multi-Phase Sample Test One (which) _____ Test Separ Test Separately _____ Shake _____		Samples Received at 4C (Y or N) _____ Appropriate Containers Used (Y or N) _____ Provide Verbal Results (Y or N) No Provide Preliminary Fax Results Yes	

Lab ID	Sample #	Date	Time	Sample Description	Matrix		Number of Containers	Analytes to be Performed						Remarks		
					Soil	Water		Other	PAHs (EPA 8270 SIM)	Priority Pollutant Metals EPA 6010/7000	Total Organic Carbon (EPA 415.2)	Dry Bulk Density (ASTM D2937)	Specific Gravity/Porosity (ASTM D854/ASA#9 21-2.2)			
02	2708-000828-002	28-Aug-00	9:20	B-37; 4.5'	X			X	X	X						
03	2708-000828-003	28-Aug-00	9:30	B-37; 11.0'	X			X	X	X		X				
05	2708-000828-005	28-Aug-00	9:55	B-39; 3.0'	X			X	X	X						
06	2708-000828-006	28-Aug-00	10:05	B-39; 9.5'	X			X	X	X						
08	2708-000828-008	28-Aug-00	10:30	B-41; 2.5'	X			X	X	X						
09	2708-000828-009	28-Aug-00	10:39	B-41; 9.5'	X			X	X	X		X				
011	2708-000828-011	28-Aug-00	11:06	B-40; 2.5'	X			X	X	X						
012	2708-000828-012	28-Aug-00	11:25	B-40; 9.5'	X			X	X	X						
013	2708-000828-013	28-Aug-00	11:30	B-40; 11.5'	X			1								
015	2708-000828-015	28-Aug-00	12:05	B-38; 2.0'	X			2	X	X						
016	2708-000828-016	28-Aug-00	12:15	B-38; 8.5'	X			3	X	X		X	X			
018	2708-000828-018	28-Aug-00	12:45	B-36; 3.5'	X			2	X	X		X	X			

Relinquished by RVS Ede Date 9/30/00 Time 10:15 Company HAI

Relinquished by 1 Dew You Date _____ Time _____ Company EKL

Relinquished by _____ Date _____ Time _____ Company _____

Comments
 NOTE:
 All Normal TAT
 Prices as per Darwin to Ede Quote (August 2000)
 Receive approval from Rob Ede prior to disposing of any samples.
 Capped Core Sample is to be used for Bulk Density/Porosity Testing only; otherwise do not open or otherwise disturb.

HAIN AND ASSOCIATES, INC.
 Environmental Management
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Laboratory Environmental Services Laboratory, Inc.
 Portland, Oregon
 Lab Project No. 6008163

CHAIN OF CUSTODY
 Chain of Custody No. 2708-S073

Project Manager Rob Ede
 Project No. 2708
 Project Name NW Natural/Guaco; Subsurface
 Collected by Rob Ede

Liquid with Sediment Sample
 Test Filtrate _____ Test Sedim Test Sediment _____
Multi-Phase Sample
 Test One (which) _____ Test Separ Test Separately _____ Shake _____

Samples Received at 4C (Y or N) _____
 Appropriate Containers Used (Y or N) _____
 Provide Verbal Results (Y or N) No
 Provide Preliminary Fox Results Yes

Comments
 NOTE:
 All Normal TAT
 Prices as per Darwin to Ede Quote (August 2000)
 Receive approval from Rob Ede prior to disposing of any samples.
 Capped Core Sample is to be used for Bulk Density/Porosity Testing only; otherwise do not open or otherwise disturb.

Lab ID	Sample #	Date	Time	Sample Description	Matrix			Analyses to be Performed						Remarks	
					Soil	Water	Other	Number of Containers	PAHs (EPA 8270 SIM)	BTEX (EPA 8020)	Priority Pollutant Metals EPA 6010/7000	Total Organic Carbon (EPA 4152)	Dry Bulk Density (ASTM D2937)		Specific Gravity/Porosity (ASTM D854/ASA#9 21-22)
019	2708-000828-019	28-Aug-00	13:05	B-36; 10.0'	X			8	X	X	X	X	X	X	
021	2708-000828-021	28-Aug-00	13:20	B-42; 1.0'	X			2	X	X	X				
022	2708-000828-022	28-Aug-00	13:30	B-42; 7.5'	X			8	X	X	X	X	X	X	
024	2708-000828-024	28-Aug-00	14:00	B-61; 2.0'	X			2			X				
025	2708-000828-025	28-Aug-00	14:10	B-61; 8.5'	X			8			X	X	X	X	
027	2708-000828-027	28-Aug-00	14:30	B-62; 3.5'	X			2	X		X				
028	2708-000828-028	28-Aug-00	14:43	B-62; 10.6'	X			2			X				
029	2708-000828-029	28-Aug-00	14:45	B-52; 11.5'	X			1				X	X		
031	2708-000828-031	28-Aug-00	15:25	B-48; 5.0'	X			2	X	X	X				
032	2708-000828-032	28-Aug-00	15:35	B-48; 9.5'	X			2	X	X	X				
034	2708-000828-034	28-Aug-00	15:58	B-50; 1.0'	X			2	X	X	X				
035	2708-000828-035	28-Aug-00	16:10	B-50; 6.0'	X			3	X	X	X	X	X	X	

Relinquished by RAAF Date 8/31/00 Time 10:40 Received by Down Company ESL
 Relinquished by _____ Date _____ Time _____ Received by _____ Company _____
 Relinquished by _____ Date _____ Time _____ Received by _____ Company _____

HAHN AND ASSOCIATES, INC.

Environmental Management

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Laboratory Environmental Services Laboratory, Inc.

Portland, Oregon

Lab Project No. 6008163

CHAIN OF CUSTODY

Chain of Custody No. 2708-S074

Project Manager Rob Ede 2708 Project Name NW Natural/Cases; Subsurface Collected by Rob Ede		Samples Received at 4C (Y or N) Appropriate Containers Used (Y or N) Provide Verbal Results (Y or N) Provide Preliminary Fax Results			
Liquid with Sediment Sample Test Filtrate Test Sediment Test Both		Multi-Phase Sample Test One (which) Test Separately Shake			
Matrix Soil Water Other		Analyses to be Performed PAHs (EPA 8270 SIM) BTEX (EPA 8020) Priority Pollutant Metals EPA 6010/7000 Total Organic Carbon (EPA 415.2) Dry Bulk Density (ASTM D2937) Specific Gravity/Porosity (ASTM D854/ASA#9 21-22)			
Comments NOTE: All Normal TAT Prices as per Darwin to Ede Quote (August 2000) Receive approval from Rob Ede prior to disposing of any samples. Capped Core Sample is to be used for Bulk Density/Porosity Testing only; otherwise do not open or otherwise disturb.		RUSH			
Lab ID	Sample #	Date	Time	Sample Description	Remarks
037	2708-000828-037	28-Aug-00	16:45	B-49; 1.5'	
038	2708-000828-038	28-Aug-00	17:00	B-49; 8.0'	
Relinquished by <u>Rob Ede</u> Date <u>8/30/00</u> Time <u>1:00</u> Company <u>HAI</u>					
Relinquished by <u>Paul</u> Date <u>8/30/00</u> Time <u>1:00</u> Company <u>RL</u>					
Relinquished by _____ Date _____ Time _____ Company _____					

HAHN AND ASSOCIATES, INC.
 Environmental Management
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Laboratory Environmental Services Laboratory, Inc.
 Portland, Oregon

CHAIN OF CUSTODY
 Chain of Custody No. 2708-S075

Project Manager Rob Ede
 2708
Project No. 2708
Project Name NW Natural/Gasco; Surface
Collected by Rob Ede

Liquid with Sediment Sample
 Test Filtrate _____ Test Sedim Test Sediment _____ Test Both _____
Multi-Phase Sample
 Test One (which) _____ Test Separ Test Separately _____ Shake _____

Comments
 NOTE:
 All Normal TAT
 Prices as per Darwin to Ede Quote (August 2000)
 Receive approval from Rob Ede prior to disposing of any samples.

Lab ID	Sample #	Date	Time	Sample Description	Matrix		Analyses to be Performed						Remarks			
					Soil	Water	Other	Number of Containers	PAHs (EPA 8270 SIM)	BTEX (EPA 8020)	Priority Pollutant Metals EPA 6010/7000	Total Organic Carbon (EPA 415.2)		Dry Bulk Density (ASTM D2937)	Specific Gravity/Porosity (ASTM D854/ASA#9 21-22)	
039	2708-000829-039	29-Aug-00	8:15	B-47; surface	X			2	X		X					
040	2708-000829-040	29-Aug-00	8:16	B-47	X			2	X		X					
050	2708-000829-050	29-Aug-00	10:55	B-43; surface	X			2	X		X					
052	2708-000829-052	29-Aug-00	11:30	B-44; surface	X			1	X		X					
054	2708-000829-054	29-Aug-00	12:00	B-45; surface	X			2	X		X					
058	2708-000829-058	29-Aug-00	13:30	B-46; surface	X			1	X		X					
061	2708-000829-061	29-Aug-00	14:15	SS-12	X			1	X		X					
062	2708-000829-062	29-Aug-00	14:00	SS-13	X			1	X		X					
063	2708-000829-063	29-Aug-00	14:04	SS-14	X			1	X		X					
064	2708-000829-064	29-Aug-00	14:20	SS-15	X			1	X		X					
065	2708-000829-065	29-Aug-00	13:31	B-46	X			1	X		X					

Relinquished by *[Signature]* **HAIF** **8/31/00** **1540** **Time** **13:16** **Company**
 Relinquished by _____ **Date** **Received by** **Company**
 Relinquished by _____ **Date** **Received by** **Company**

Case Narrative

ESL Job: 0008163

February 26 2001

Sample numbers -31; -32; -34; -35; -38; -42; -43; -53 were all analyzed for PAHs and "S" flagged. The "S" flag should be an "X" flag. An "X" flag denotes the inability to quantify surrogates due to sample dilution. These samples in particular had extremely high levels of analytes making it impossible to analyze the samples without a large and significant dilution.

The BTEX analysis for samples -31; -32; -34; -35; -38 were all "X" flagged. An "X" flag denotes the inability to quantify surrogates due to sample dilution. These samples also had extremely high levels of analytes making it impossible to analyze the samples without a large and significant dilution.

As a note of explanation, surrogate compounds are added to sample matrices prior to initial analysis. When high levels of analytes are present, they typically interfere with the ability to detect surrogates. Also, when analytes are present at levels so high as to be unquantifiable, dilutions are necessitated.

Please do not hesitate to call if there are any questions, or if we can be of further assistance in this project. Thank you.

Aden Smith, Senior Chemist

Case Narrative

ESL Job: 0008163
Run Batch: ICP_000906A
Prep Batch: 1822

Sep. 7, 2000

The Relative Percent Difference (RPD) between the Sample and Sample Duplicate was outside of control limits for Chromium and Nickel. The RPD between the Matrix Spike (MS) and the Matrix Spike Duplicate (MSD) was within the control limits for Chromium and Nickel satisfying method criteria.

The spike recovery for Antimony, Selenium and Thallium is outside control limits in the MS and MSD. A Post Digestion Spike (PDS) was performed and acceptable recovery for those elements were obtained. In addition, all instrumental Quality Control Samples were within control limits, thereby validating the batch.

Please do not hesitate to call if there are any questions, or if we can be of further assistance in this project. Thank you.

Chris Schneider, Chemist

Case Narrative

ESL Job: 0008163
Run Batch: ICP_000906B
Prep Batch: 1823

Sep. 11, 2000

The Spike Recovery for Antimony, Arsenic, Selenium and Thallium was outside of control limits for the Matrix Spike (MS) and Matrix Spike Duplicate (MSD). Additionally, the Spike Recovery was outside of control limits for Chromium and Lead in the MSD. A Post Digestion Spike (PDS) was performed, and acceptable Spike Recovery was obtained for all of the elements listed above. Also, all batch and instrumental Quality Control was within method criteria, validating the batch.

Please do not hesitate to call if there are any questions, or if we can be of further assistance in this project. Thank you.

Chris Schneider, Chemist

Case Narrative

ESL Job: 0008163
Run Batch: ICP_000906B
Prep Batch: 1830

Sep. 11, 2000

The spike recoveries for Antimony were outside of control limits in the Matrix Spike (MS) and the Matrix Spike Duplicate (MSD). A Post Digestion Spike (PDS) was performed, and acceptable spike recovery was obtained. In addition, all batch Quality Control (QC) was within specifications, validating batch.

Please do not hesitate to call if there are any questions, or if we can be of further assistance in this project. Thank you.

Chris Schneider, Chemist

Case Narrative

ESL Job: 0008163

April 3, 2001

The matrix spike duplicate was outside control limits for Pyrene. However, the matrix Spike, laboratory control spike, and the laboratory control spike duplicate were all within control limits, therefore, validating the batch.

Please do not hesitate to call if there are any questions, or if we can be of further assistance in this project. Thank you.

Aden Smith - Chemist

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-01B

Client Sample ID: 2708-000828-001
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: Imc
Antimony	1.73	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	5.43	1.00		mg/Kg	1	9/6/00
Copper	10.2	1.00		mg/Kg	1	9/6/00
Lead	7.69	1.00		mg/Kg	1	9/6/00
Nickel	3.98	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	49.8	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	455	50.0		µg/Kg	1	9/7/00
Acenaphthylene	60.0	50.0		µg/Kg	1	9/7/00
Anthracene	735	50.0		µg/Kg	1	9/7/00
Benz(a)anthracene	4,700	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	7,350	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	6,500	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	6,300	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	4,920	50.0		µg/Kg	1	9/7/00
Chrysene	5,850	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	1,670	50.0		µg/Kg	1	9/7/00
Fluoranthene	8,550	50.0		µg/Kg	1	9/7/00
Fluorene	200	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	5,050	50.0		µg/Kg	1	9/7/00
Naphthalene	55.0	50.0		µg/Kg	1	9/7/00
Phenanthrene	3,960	50.0		µg/Kg	1	9/7/00
Pyrene	7,500	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	99.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	96.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	103.0	23-120		%REC	1	9/7/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-02A

Client Sample ID: 2708-000828-002
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.66		µg/Kg-dry	1	8/31/00
Ethylbenzene	ND	2.66		µg/Kg-dry	1	8/31/00
Toluene	ND	2.66		µg/Kg-dry	1	8/31/00
Xylenes, Total	ND	7.98		µg/Kg-dry	1	8/31/00
Surr: Trifluorotoluene	105.0	70-130		%REC	1	8/31/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	6.00	0		wt%	1	8/31/00

Qualifiers:

ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits
J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank	E - Value above quantitation range
* - Value exceeds Maximum Contaminant Level	

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-02B

Client Sample ID: 2708-000828-002
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	ND	1.00		mg/Kg	1	9/6/00
Arsenic	3.20	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	13.5	1.00		mg/Kg	1	9/6/00
Copper	10.3	1.00		mg/Kg	1	9/6/00
Lead	2.61	1.00		mg/Kg	1	9/6/00
Nickel	16.1	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	51.9	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	ND	50.0		µg/Kg	1	9/7/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/7/00
Anthracene	ND	50.0		µg/Kg	1	9/7/00
Benzo(a)anthracene	250	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	365	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	330	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	475	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	250	50.0		µg/Kg	1	9/7/00
Chrysene	300	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	95.0	50.0		µg/Kg	1	9/7/00
Fluoranthene	540	50.0		µg/Kg	1	9/7/00
Fluorene	ND	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	375	50.0		µg/Kg	1	9/7/00
Naphthalene	ND	50.0		µg/Kg	1	9/7/00
Phenanthrene	210	50.0		µg/Kg	1	9/7/00
Pyrene	515	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	88.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	82.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	90.0	23-120		%REC	1	9/7/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-03A

Client Sample ID: 2708-000828-003
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.75		µg/Kg-dry	1	8/31/00
Ethylbenzene	ND	2.75		µg/Kg-dry	1	8/31/00
Toluene	ND	2.75		µg/Kg-dry	1	8/31/00
Xylenes, Total	ND	8.24		µg/Kg-dry	1	8/31/00
Surr: Trifluorotoluene	103.0	70-130		%REC	1	8/31/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	9.00	0		wt%	1	8/31/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-03B

Client Sample ID: 2708-000828-003
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
PAH BY SIM, SOIL		8270-SIM				Analyst: ams	
Acenaphthene	ND	50.0		µg/Kg	1	9/5/00	
Acenaphthylene	ND	50.0		µg/Kg	1	9/5/00	
Anthracene	ND	50.0		µg/Kg	1	9/5/00	
Benzo(a)anthracene	ND	50.0		µg/Kg	1	9/5/00	
Benzo(a)pyrene	ND	50.0		µg/Kg	1	9/5/00	
Benzo(b)fluoranthene	ND	50.0		µg/Kg	1	9/5/00	
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	9/5/00	
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	9/5/00	
Chrysene	ND	50.0		µg/Kg	1	9/5/00	
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	9/5/00	
Fluoranthene	ND	50.0		µg/Kg	1	9/5/00	
Fluorene	ND	50.0		µg/Kg	1	9/5/00	
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	9/5/00	
Naphthalene	ND	50.0		µg/Kg	1	9/5/00	
Phenanthrene	ND	50.0		µg/Kg	1	9/5/00	
Pyrene	ND	50.0		µg/Kg	1	9/5/00	
Surr: 2-Fluorobiphenyl	96.5	30-115		%REC	1	9/5/00	
Surr: 4-Terphenyl-d14	100.5	18-137		%REC	1	9/5/00	
Surr: Nitrobenzene-d5	83.5	23-120		%REC	1	9/5/00	

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-04B

Client Sample ID: 2708-000828-004
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY						
		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS						
		EPA 6010B				Analyst: Imc
Antimony	1.43	1.00		mg/Kg	1	9/6/00
Arsenic	5.05	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	18.9	1.00		mg/Kg	1	9/6/00
Copper	22.0	1.00		mg/Kg	1	9/6/00
Lead	36.6	1.00		mg/Kg	1	9/6/00
Nickel	84.0	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	82.7	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL						
		8270-SIM				Analyst: keh
Acenaphthene	85.0	50.0		µg/Kg	1	9/7/00
Acenaphthylene	55.0	50.0		µg/Kg	1	9/7/00
Anthracene	ND	50.0		µg/Kg	1	9/7/00
Benz(a)anthracene	1,000	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	1,360	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	1,160	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	1,020	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	705	50.0		µg/Kg	1	9/7/00
Chrysene	1,130	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	255	50.0		µg/Kg	1	9/7/00
Fluoranthene	1,620	50.0		µg/Kg	1	9/7/00
Fluorene	ND	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	880	50.0		µg/Kg	1	9/7/00
Naphthalene	60.0	50.0		µg/Kg	1	9/7/00
Phenanthrene	520	50.0		µg/Kg	1	9/7/00
Pyrene	1,720	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	90.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	91.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	91.0	23-120		%REC	1	9/7/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-05A

Client Sample ID: 2708-000828-005
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.94		µg/Kg-dry	1	8/31/00
Ethylbenzene	ND	2.94		µg/Kg-dry	1	8/31/00
Toluene	ND	2.94		µg/Kg-dry	1	8/31/00
Xylenes, Total	ND	8.82		µg/Kg-dry	1	8/31/00
Surr: Trifluorotoluene	101.0	70-130		%REC	1	8/31/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	15.0	0		wt%	1	8/31/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-05B

Client Sample ID: 2708-000828-005
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				
Mercury	ND	0.100		mg/Kg	1	9/6/00
						Analyst: cms
ICP METALS		EPA 6010B				
Antimony	1.42	1.00		mg/Kg	1	9/6/00
Arsenic	4.86	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	15.1	1.00		mg/Kg	1	9/6/00
Copper	14.9	1.00		mg/Kg	1	9/6/00
Lead	15.7	1.00		mg/Kg	1	9/6/00
Nickel	12.5	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	55.6	1.00		mg/Kg	1	9/6/00
						Analyst: lmc
PAH BY SIM, SOIL		8270-SIM				
Acenaphthene	ND	50.0		µg/Kg	1	9/8/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/8/00
Anthracene	ND	50.0		µg/Kg	1	9/8/00
Benzo(a)anthracene	ND	50.0		µg/Kg	1	9/8/00
Benzo(a)pyrene	ND	50.0		µg/Kg	1	9/8/00
Benzo(b)fluoranthene	ND	50.0		µg/Kg	1	9/8/00
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	9/8/00
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	9/8/00
Chrysene	ND	50.0		µg/Kg	1	9/8/00
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	9/8/00
Fluoranthene	ND	50.0		µg/Kg	1	9/8/00
Fluorene	ND	50.0		µg/Kg	1	9/8/00
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	9/8/00
Naphthalene	ND	50.0		µg/Kg	1	9/8/00
Phenanthrene	ND	50.0		µg/Kg	1	9/8/00
Pyrene	ND	50.0		µg/Kg	1	9/8/00
Surr: 2-Fluorobiphenyl	95.0	30-115		%REC	1	9/8/00
Surr: 4-Terphenyl-d14	80.0	18-137		%REC	1	9/8/00
Surr: Nitrobenzene-d5	89.0	23-120		%REC	1	9/8/00
						Analyst: keh

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-06A

Client Sample ID: 2708-000828-006
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.78		µg/Kg-dry	1	8/31/00
Ethylbenzene	ND	2.78		µg/Kg-dry	1	8/31/00
Toluene	ND	2.78		µg/Kg-dry	1	8/31/00
Xylenes, Total	ND	8.33		µg/Kg-dry	1	8/31/00
Surr: Trifluorotoluene	103.0	70-130		%REC	1	8/31/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	10.0	0		wt%	1	8/31/00

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-06B

Client Sample ID: 2708-000828-006
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		8270-SIM				Analyst: ams
Acenaphthene	ND	50.0		µg/Kg	1	9/5/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/5/00
Anthracene	ND	50.0		µg/Kg	1	9/5/00
Benz(a)anthracene	ND	50.0		µg/Kg	1	9/5/00
Benzo(a)pyrene	ND	50.0		µg/Kg	1	9/5/00
Benzo(b)fluoranthene	ND	50.0		µg/Kg	1	9/5/00
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	9/5/00
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	9/5/00
Chrysene	ND	50.0		µg/Kg	1	9/5/00
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	9/5/00
Fluoranthene	ND	50.0		µg/Kg	1	9/5/00
Fluorene	ND	50.0		µg/Kg	1	9/5/00
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	9/5/00
Naphthalene	ND	50.0		µg/Kg	1	9/5/00
Phenanthrene	ND	50.0		µg/Kg	1	9/5/00
Pyrene	ND	50.0		µg/Kg	1	9/5/00
Surr: 2-Fluorobiphenyl	107.0	30-115		%REC	1	9/5/00
Surr: 4-Terphenyl-d14	111.0	18-137		%REC	1	9/5/00
Surr: Nitrobenzene-d5	83.0	23-120		%REC	1	9/5/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-07B

Client Sample ID: 2708-000828-007
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.96	1.00		mg/Kg	1	9/6/00
Arsenic	4.97	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	14.7	1.00		mg/Kg	1	9/6/00
Copper	19.7	1.00		mg/Kg	1	9/6/00
Lead	21.4	1.00		mg/Kg	1	9/6/00
Nickel	20.9	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	74.4	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	165	50.0		µg/Kg	1	9/7/00
Acenaphthylene	170	50.0		µg/Kg	1	9/7/00
Anthracene	ND	50.0		µg/Kg	1	9/7/00
Benz(a)anthracene	2,160	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	3,100	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	2,640	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	2,560	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	1,740	50.0		µg/Kg	1	9/7/00
Chrysene	2,430	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	595	50.0		µg/Kg	1	9/7/00
Fluoranthene	3,860	50.0		µg/Kg	1	9/7/00
Fluorene	70.0	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	2,220	50.0		µg/Kg	1	9/7/00
Naphthalene	75.0	50.0		µg/Kg	1	9/7/00
Phenanthrene	1,680	50.0		µg/Kg	1	9/7/00
Pyrene	3,820	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	92.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	92.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	91.0	23-120		%REC	1	9/7/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-08A

Client Sample ID: 2708-000828-008
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.78		µg/Kg-dry	1	8/31/00
Ethylbenzene	ND	2.78		µg/Kg-dry	1	8/31/00
Toluene	ND	2.78		µg/Kg-dry	1	8/31/00
Xylenes, Total	ND	8.33		µg/Kg-dry	1	8/31/00
Surr: Trifluorotoluene	93.0	70-130		%REC	1	8/31/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	10.0	0		wt%	1	8/31/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-08B

Client Sample ID: 2708-000828-008
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.24	1.00		mg/Kg	1	9/6/00
Arsenic	4.10	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	13.7	1.00		mg/Kg	1	9/6/00
Copper	19.0	1.00		mg/Kg	1	9/6/00
Lead	24.6	1.00		mg/Kg	1	9/6/00
Nickel	21.1	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	57.9	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	130	100		µg/Kg	2	9/9/00
Acenaphthylene	260	100		µg/Kg	2	9/9/00
Anthracene	410	100		µg/Kg	2	9/9/00
Benz(a)anthracene	1,870	100		µg/Kg	2	9/9/00
Benzo(a)pyrene	2,860	100		µg/Kg	2	9/9/00
Benzo(b)fluoranthene	2,130	100		µg/Kg	2	9/9/00
Benzo(g,h,i)perylene	2,090	100		µg/Kg	2	9/9/00
Benzo(k)fluoranthene	1,580	100		µg/Kg	2	9/9/00
Chrysene	2,230	100		µg/Kg	2	9/9/00
Dibenz(a,h)anthracene	420	100		µg/Kg	2	9/9/00
Fluoranthene	3,260	100		µg/Kg	2	9/9/00
Fluorene	ND	100		µg/Kg	2	9/9/00
Indeno(1,2,3-cd)pyrene	1,490	100		µg/Kg	2	9/9/00
Naphthalene	240	100		µg/Kg	2	9/9/00
Phenanthrene	2,260	100		µg/Kg	2	9/9/00
Pyrene	5,200	100		µg/Kg	2	9/9/00
Surr: 2-Fluorobiphenyl	66.0	30-115		%REC	2	9/9/00
Surr: 4-Terphenyl-d14	64.0	18-137		%REC	2	9/9/00
Surr: Nitrobenzene-d5	70.0	23-120		%REC	2	9/9/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-09A

Client Sample ID: 2708-000828-009
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.78		µg/Kg-dry	1	8/31/00
Ethylbenzene	ND	2.78		µg/Kg-dry	1	8/31/00
Toluene	ND	2.78		µg/Kg-dry	1	8/31/00
Xylenes, Total	ND	8.33		µg/Kg-dry	1	8/31/00
Surr: Trifluorotoluene	105.0	70-130		%REC	1	8/31/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	10.0	0		wt%	1	8/31/00

Qualifiers:

ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits
J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank	E - Value above quantitation range
* - Value exceeds Maximum Contaminant Level	

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-09B

Client Sample ID: 2708-000828-009
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	ND	1.00		mg/Kg	1	9/6/00
Arsenic	2.55	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	12.9	1.00		mg/Kg	1	9/6/00
Copper	12.5	1.00		mg/Kg	1	9/6/00
Lead	1.94	1.00		mg/Kg	1	9/6/00
Nickel	15.3	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	36.2	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: ams
Acenaphthene	ND	50.0		µg/Kg	1	9/5/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/5/00
Anthracene	ND	50.0		µg/Kg	1	9/5/00
Benz(a)anthracene	ND	50.0		µg/Kg	1	9/5/00
Benzo(a)pyrene	ND	50.0		µg/Kg	1	9/5/00
Benzo(b)fluoranthene	ND	50.0		µg/Kg	1	9/5/00
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	9/5/00
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	9/5/00
Chrysene	ND	50.0		µg/Kg	1	9/5/00
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	9/5/00
Fluoranthene	ND	50.0		µg/Kg	1	9/5/00
Fluorene	ND	50.0		µg/Kg	1	9/5/00
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	9/5/00
Naphthalene	ND	50.0		µg/Kg	1	9/5/00
Phenanthrene	ND	50.0		µg/Kg	1	9/5/00
Pyrene	ND	50.0		µg/Kg	1	9/5/00
Surr: 2-Fluorobiphenyl	104.0	30-115		%REC	1	9/5/00
Surr: 4-Terphenyl-d14	106.0	18-137		%REC	1	9/5/00
Surr: Nitrobenzene-d5	85.0	23-120		%REC	1	9/5/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-11A

Client Sample ID: 2708-000828-011
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.69		µg/Kg-dry	1	8/31/00
Ethylbenzene	ND	2.69		µg/Kg-dry	1	8/31/00
Toluene	ND	2.69		µg/Kg-dry	1	8/31/00
Xylenes, Total	ND	8.06		µg/Kg-dry	1	8/31/00
Surr: Trifluorotoluene	104.0	70-130		%REC	1	8/31/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	7.00	0		wt%	1	8/31/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-11B

Client Sample ID: 2708-000828-011
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	ND	1.00		mg/Kg	1	9/6/00
Arsenic	2.69	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	13.1	1.00		mg/Kg	1	9/6/00
Copper	12.2	1.00		mg/Kg	1	9/6/00
Lead	2.27	1.00		mg/Kg	1	9/6/00
Nickel	15.6	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	36.9	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: ams
Acenaphthene	ND	50.0		µg/Kg	1	9/5/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/5/00
Anthracene	ND	50.0		µg/Kg	1	9/5/00
Benz(a)anthracene	ND	50.0		µg/Kg	1	9/5/00
Benzo(a)pyrene	ND	50.0		µg/Kg	1	9/5/00
Benzo(b)fluoranthene	ND	50.0		µg/Kg	1	9/5/00
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	9/5/00
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	9/5/00
Chrysene	ND	50.0		µg/Kg	1	9/5/00
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	9/5/00
Fluoranthene	ND	50.0		µg/Kg	1	9/5/00
Fluorene	ND	50.0		µg/Kg	1	9/5/00
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	9/5/00
Naphthalene	ND	50.0		µg/Kg	1	9/5/00
Phenanthrene	ND	50.0		µg/Kg	1	9/5/00
Pyrene	ND	50.0		µg/Kg	1	9/5/00
Surr: 2-Fluorobiphenyl	103.0	30-115		%REC	1	9/5/00
Surr: 4-Terphenyl-d14	107.0	18-137		%REC	1	9/5/00
Surr: Nitrobenzene-d5	95.0	23-120		%REC	1	9/5/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-12A

Client Sample ID: 2708-000828-012
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	3.29		µg/Kg-dry	1	8/31/00
Ethylbenzene	ND	3.29		µg/Kg-dry	1	8/31/00
Toluene	ND	3.29		µg/Kg-dry	1	8/31/00
Xylenes, Total	ND	9.87		µg/Kg-dry	1	8/31/00
Surr: Trifluorotoluene	104.0	70-130		%REC	1	8/31/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	24.0	0		wt%	1	8/31/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-12B

Client Sample ID: 2708-000828-012
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		8270-SIM				Analyst: ams
Acenaphthene	ND	50.0		µg/Kg	1	9/5/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/5/00
Anthracene	ND	50.0		µg/Kg	1	9/5/00
Benz(a)anthracene	ND	50.0		µg/Kg	1	9/5/00
Benzo(a)pyrene	ND	50.0		µg/Kg	1	9/5/00
Benzo(b)fluoranthene	ND	50.0		µg/Kg	1	9/5/00
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	9/5/00
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	9/5/00
Chrysene	ND	50.0		µg/Kg	1	9/5/00
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	9/5/00
Fluoranthene	ND	50.0		µg/Kg	1	9/5/00
Fluorene	ND	50.0		µg/Kg	1	9/5/00
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	9/5/00
Naphthalene	ND	50.0		µg/Kg	1	9/5/00
Phenanthrene	ND	50.0		µg/Kg	1	9/5/00
Pyrene	ND	50.0		µg/Kg	1	9/5/00
Surr: 2-Fluorobiphenyl	112.0	30-115		%REC	1	9/5/00
Surr: 4-Terphenyl-d14	117.0	18-137		%REC	1	9/5/00
Surr: Nitrobenzene-d5	95.0	23-120		%REC	1	9/5/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-14B

Client Sample ID: 2708-000828-014
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.71	1.00		mg/Kg	1	9/6/00
Arsenic	5.26	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	24.7	1.00		mg/Kg	1	9/6/00
Copper	52.1	1.00		mg/Kg	1	9/6/00
Lead	33.5	1.00		mg/Kg	1	9/6/00
Nickel	25.6	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	69.3	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	130	50.0		µg/Kg	1	9/7/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/7/00
Anthracene	ND	50.0		µg/Kg	1	9/7/00
Benz(a)anthracene	1,580	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	2,080	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	1,800	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	1,930	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	1,120	50.0		µg/Kg	1	9/7/00
Chrysene	1,760	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	430	50.0		µg/Kg	1	9/7/00
Fluoranthene	2,940	50.0		µg/Kg	1	9/7/00
Fluorene	ND	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	1,620	50.0		µg/Kg	1	9/7/00
Naphthalene	ND	50.0		µg/Kg	1	9/7/00
Phenanthrene	1,110	50.0		µg/Kg	1	9/7/00
Pyrene	2,680	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	103.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	99.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	97.0	23-120		%REC	1	9/7/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT:	Hahn & Associates	Client Sample ID:	2708-000828-015
Lab Order:	0008163	Tag Number:	
Project:	NW Natural/Gasco	Collection Date:	8/28/00
Lab ID:	0008163-15A	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.84		µg/Kg-dry	1	8/31/00
Ethylbenzene	ND	2.84		µg/Kg-dry	1	8/31/00
Toluene	ND	2.84		µg/Kg-dry	1	8/31/00
Xylenes, Total	ND	8.52		µg/Kg-dry	1	8/31/00
Surr: Trifluorotoluene	99.6	70-130		%REC	1	8/31/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	12.0	0		wt%	1	8/31/00

Qualifiers:

ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits
J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank	E - Value above quantitation range
* - Value exceeds Maximum Contaminant Level	

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-15B

Client Sample ID: 2708-000828-015
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: Imc
Antimony	2.92	1.00		mg/Kg	1	9/6/00
Arsenic	6.37	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	19.7	1.00		mg/Kg	1	9/6/00
Copper	35.2	1.00		mg/Kg	1	9/6/00
Lead	40.3	1.00		mg/Kg	1	9/6/00
Nickel	17.9	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	70.3	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	ND	500		µg/Kg	10	9/9/00
Acenaphthylene	ND	500		µg/Kg	10	9/9/00
Anthracene	ND	500		µg/Kg	10	9/9/00
Benz(a)anthracene	1,150	500		µg/Kg	10	9/9/00
Benzo(a)pyrene	850	500		µg/Kg	10	9/9/00
Benzo(b)fluoranthene	1,550	500		µg/Kg	10	9/9/00
Benzo(g,h,i)perylene	650	500		µg/Kg	10	9/9/00
Benzo(k)fluoranthene	ND	500		µg/Kg	10	9/9/00
Chrysene	800	500		µg/Kg	10	9/9/00
Dibenz(a,h)anthracene	ND	500		µg/Kg	10	9/9/00
Fluoranthene	1,150	500		µg/Kg	10	9/9/00
Fluorene	ND	500		µg/Kg	10	9/9/00
Indeno(1,2,3-cd)pyrene	550	500		µg/Kg	10	9/9/00
Naphthalene	ND	500		µg/Kg	10	9/9/00
Phenanthrene	1,850	500		µg/Kg	10	9/9/00
Pyrene	1,850	500		µg/Kg	10	9/9/00
Surr: 2-Fluorobiphenyl	110.0	30-115		%REC	10	9/9/00
Surr: 4-Terphenyl-d14	140.0	18-137	S	%REC	10	9/9/00
Surr: Nitrobenzene-d5	110.0	23-120		%REC	10	9/9/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-16A

Client Sample ID: 2708-000828-016
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	3.05		µg/Kg-dry	1	9/1/00
Ethylbenzene	ND	3.05		µg/Kg-dry	1	9/1/00
Toluene	ND	3.05		µg/Kg-dry	1	9/1/00
Xylenes, Total	ND	9.15		µg/Kg-dry	1	9/1/00
Surr: Trifluorotoluene	96.1	70-130		%REC	1	9/1/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	18.0	0		wt%	1	8/31/00

Qualifiers:

ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits
J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank	E - Value above quantitation range
* - Value exceeds Maximum Contaminant Level	

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-16B

Client Sample ID: 2708-000828-016
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	ND	50.0		µg/Kg	1	9/8/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/8/00
Anthracene	ND	50.0		µg/Kg	1	9/8/00
Benz(a)anthracene	95.0	50.0		µg/Kg	1	9/8/00
Benzo(a)pyrene	ND	50.0		µg/Kg	1	9/8/00
Benzo(b)fluoranthene	135	50.0		µg/Kg	1	9/8/00
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	9/8/00
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	9/8/00
Chrysene	90.0	50.0		µg/Kg	1	9/8/00
Dibenz(a,h)anthracene	75.0	50.0		µg/Kg	1	9/8/00
Fluoranthene	90.0	50.0		µg/Kg	1	9/8/00
Fluorene	ND	50.0		µg/Kg	1	9/8/00
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	9/8/00
Naphthalene	ND	50.0		µg/Kg	1	9/8/00
Phenanthrene	135	50.0		µg/Kg	1	9/8/00
Pyrene	100	50.0		µg/Kg	1	9/8/00
Surr: 2-Fluorobiphenyl	89.0	30-115		%REC	1	9/8/00
Surr: 4-Terphenyl-d14	82.0	18-137		%REC	1	9/8/00
Surr: Nitrobenzene-d5	80.0	23-120		%REC	1	9/8/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-17B

Client Sample ID: 2708-000828-017
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.27	1.00		mg/Kg	1	9/6/00
Arsenic	4.16	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	18.0	1.00		mg/Kg	1	9/6/00
Copper	29.7	1.00		mg/Kg	1	9/6/00
Lead	40.2	1.00		mg/Kg	1	9/6/00
Nickel	14.4	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	82.8	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	105	50.0		µg/Kg	1	9/8/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/8/00
Anthracene	ND	50.0		µg/Kg	1	9/8/00
Benz(a)anthracene	980	50.0		µg/Kg	1	9/8/00
Benzo(a)pyrene	1,380	50.0		µg/Kg	1	9/8/00
Benzo(b)fluoranthene	1,230	50.0		µg/Kg	1	9/8/00
Benzo(g,h,i)perylene	600	50.0		µg/Kg	1	9/8/00
Benzo(k)fluoranthene	1,050	50.0		µg/Kg	1	9/8/00
Chrysene	1,160	50.0		µg/Kg	1	9/8/00
Dibenz(a,h)anthracene	215	50.0		µg/Kg	1	9/8/00
Fluoranthene	1,520	50.0		µg/Kg	1	9/8/00
Fluorene	ND	50.0		µg/Kg	1	9/8/00
Indeno(1,2,3-cd)pyrene	575	50.0		µg/Kg	1	9/8/00
Naphthalene	105	50.0		µg/Kg	1	9/8/00
Phenanthrene	700	50.0		µg/Kg	1	9/8/00
Pyrene	1,470	50.0		µg/Kg	1	9/8/00
Surr: 2-Fluorobiphenyl	104.0	30-115		%REC	1	9/8/00
Surr: 4-Terphenyl-d14	97.0	18-137		%REC	1	9/8/00
Surr: Nitrobenzene-d5	82.0	23-120		%REC	1	9/8/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-18A

Client Sample ID: 2708-000828-018
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.94		µg/Kg-dry	1	8/31/00
Ethylbenzene	ND	2.94		µg/Kg-dry	1	8/31/00
Toluene	ND	2.94		µg/Kg-dry	1	8/31/00
Xylenes, Total	ND	8.82		µg/Kg-dry	1	8/31/00
Surr: Trifluorotoluene	97.4	70-130		%REC	1	8/31/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	15.0	0		wt%	1	8/31/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-18B

Client Sample ID: 2708-000828-018
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY						
		EPA 7471A				
Mercury	ND	0.100		mg/Kg	1	9/6/00
Analyst: cms						
ICP METALS						
		EPA 6010B				
Antimony	1.59	1.00		mg/Kg	1	9/6/00
Arsenic	4.89	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	15.2	1.00		mg/Kg	1	9/6/00
Copper	18.9	1.00		mg/Kg	1	9/6/00
Lead	47.0	1.00		mg/Kg	1	9/6/00
Nickel	12.3	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	67.3	1.00		mg/Kg	1	9/6/00
Analyst: lmc						
PAH BY SIM, SOIL						
		8270-SIM				
Acenaphthene	ND	50.0		µg/Kg	1	9/7/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/7/00
Anthracene	ND	50.0		µg/Kg	1	9/7/00
Benzo(a)anthracene	70.0	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	100	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	110	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	130	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	65.0	50.0		µg/Kg	1	9/7/00
Chrysene	80.0	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	9/7/00
Fluoranthene	155	50.0		µg/Kg	1	9/7/00
Fluorene	ND	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	90.0	50.0		µg/Kg	1	9/7/00
Naphthalene	120	50.0		µg/Kg	1	9/7/00
Phenanthrene	70.0	50.0		µg/Kg	1	9/7/00
Pyrene	170	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	90.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	85.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	96.0	23-120		%REC	1	9/7/00
Analyst: keh						

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-19A

Client Sample ID: 2708-000828-019
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	3.05		µg/Kg-dry	1	8/31/00
Ethylbenzene	ND	3.05		µg/Kg-dry	1	8/31/00
Toluene	ND	3.05		µg/Kg-dry	1	8/31/00
Xylenes, Total	ND	9.15		µg/Kg-dry	1	8/31/00
Surr: Trifluorotoluene	96.1	70-130		%REC	1	8/31/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	18.0	0		wt%	1	8/31/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-19B

Client Sample ID: 2708-000828-019
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY						
		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS						
		EPA 6010B				Analyst: lmc
Antimony	1.26	1.00		mg/Kg	1	9/6/00
Arsenic	2.07	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	6.58	1.00		mg/Kg	1	9/6/00
Copper	13.1	1.00		mg/Kg	1	9/6/00
Lead	8.56	1.00		mg/Kg	1	9/6/00
Nickel	6.91	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	45.2	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL						
		8270-SIM				Analyst: keh
Acenaphthene	ND	50.0		µg/Kg	1	9/8/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/8/00
Anthracene	ND	50.0		µg/Kg	1	9/8/00
Benzo(a)anthracene	90.0	50.0		µg/Kg	1	9/8/00
Benzo(a)pyrene	50	50.0		µg/Kg	1	9/8/00
Benzo(b)fluoranthene	120	50.0		µg/Kg	1	9/8/00
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	9/8/00
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	9/8/00
Chrysene	55.0	50.0		µg/Kg	1	9/8/00
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	9/8/00
Fluoranthene	80.0	50.0		µg/Kg	1	9/8/00
Fluorene	ND	50.0		µg/Kg	1	9/8/00
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	9/8/00
Naphthalene	ND	50.0		µg/Kg	1	9/8/00
Phenanthrene	135	50.0		µg/Kg	1	9/8/00
Pyrene	105	50.0		µg/Kg	1	9/8/00
Surr: 2-Fluorobiphenyl	112.0	30-115		%REC	1	9/8/00
Surr: 4-Terphenyl-d14	101.0	18-137		%REC	1	9/8/00
Surr: Nitrobenzene-d5	111.0	23-120		%REC	1	9/8/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-20B

Client Sample ID: 2708-000828-020
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.16	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	ND	1.00		mg/Kg	1	9/6/00
Copper	4.30	1.00		mg/Kg	1	9/6/00
Lead	ND	1.00		mg/Kg	1	9/6/00
Nickel	ND	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	27.5	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: ams
Acenaphthene	ND	50.0		µg/Kg	1	9/5/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/5/00
Anthracene	ND	50.0		µg/Kg	1	9/5/00
Benz(a)anthracene	120	50.0		µg/Kg	1	9/5/00
Benzo(a)pyrene	185	50.0		µg/Kg	1	9/5/00
Benzo(b)fluoranthene	135	50.0		µg/Kg	1	9/5/00
Benzo(g,h,i)perylene	180	50.0		µg/Kg	1	9/5/00
Benzo(k)fluoranthene	170	50.0		µg/Kg	1	9/5/00
Chrysene	160	50.0		µg/Kg	1	9/5/00
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	9/5/00
Fluoranthene	205	50.0		µg/Kg	1	9/5/00
Fluorene	ND	50.0		µg/Kg	1	9/5/00
Indeno(1,2,3-cd)pyrene	55.0	50.0		µg/Kg	1	9/5/00
Naphthalene	ND	50.0		µg/Kg	1	9/5/00
Phenanthrene	115	50.0		µg/Kg	1	9/5/00
Pyrene	195	50.0		µg/Kg	1	9/5/00
Surr: 2-Fluorobiphenyl	114.0	30-115		%REC	1	9/5/00
Surr: 4-Terphenyl-d14	111.0	18-137		%REC	1	9/5/00
Surr: Nitrobenzene-d5	107.0	23-120		%REC	1	9/5/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-21A

Client Sample ID: 2708-000828-021
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.69		µg/Kg-dry	1	8/31/00
Ethylbenzene	ND	2.69		µg/Kg-dry	1	8/31/00
Toluene	ND	2.69		µg/Kg-dry	1	8/31/00
Xylenes, Total	ND	8.06		µg/Kg-dry	1	8/31/00
Surr: Trifluorotoluene	100.0	70-130		%REC	1	8/31/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	7.00	0		wt%	1	8/31/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT:	Hahn & Associates	Client Sample ID:	2708-000828-021
Lab Order:	0008163	Tag Number:	
Project:	NW Natural/Gasco	Collection Date:	8/28/00
Lab ID:	0008163-21B	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	ND	1.00		mg/Kg	1	9/6/00
Arsenic	2.74	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	13.7	1.00		mg/Kg	1	9/6/00
Copper	12.4	1.00		mg/Kg	1	9/6/00
Lead	3.19	1.00		mg/Kg	1	9/6/00
Nickel	16.5	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	64.2	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	220	50.0		µg/Kg	1	9/7/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/7/00
Anthracene	ND	50.0		µg/Kg	1	9/7/00
Benz(a)anthracene	2,470	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	3,260	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	2,470	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	2,770	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	1,830	50.0		µg/Kg	1	9/7/00
Chrysene	2,680	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	605	50.0		µg/Kg	1	9/7/00
Fluoranthene	4,860	50.0		µg/Kg	1	9/7/00
Fluorene	80.0	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	2,220	50.0		µg/Kg	1	9/7/00
Naphthalene	180	50.0		µg/Kg	1	9/7/00
Phenanthrene	1,980	50.0		µg/Kg	1	9/7/00
Pyrene	4,120	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	95.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	89.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	105.0	23-120		%REC	1	9/7/00

Qualifiers:	ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits
	J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits
	B - Analyte detected in the associated Method Blank	E - Value above quantitation range
	* - Value exceeds Maximum Contaminant Level	

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-22A

Client Sample ID: 2708-000828-022
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.72		µg/Kg-dry	1	9/1/00
Ethylbenzene	ND	2.72		µg/Kg-dry	1	9/1/00
Toluene	ND	2.72		µg/Kg-dry	1	9/1/00
Xylenes, Total	ND	8.15		µg/Kg-dry	1	9/1/00
Surr: Trifluorotoluene	104.0	70-130		%REC	1	9/1/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	8.00	0		wt%	1	8/31/00

Qualifiers:

ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits
J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank	E - Value above quantitation range
* - Value exceeds Maximum Contaminant Level	

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-22B

Client Sample ID: 2708-000828-022
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	ND	50.0		µg/Kg	1	9/7/00
Acenaphthylene	260	50.0		µg/Kg	1	9/7/00
Anthracene	ND	50.0		µg/Kg	1	9/7/00
Benz(a)anthracene	255	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	405	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	275	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	675	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	210	50.0		µg/Kg	1	9/7/00
Chrysene	370	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	90.0	50.0		µg/Kg	1	9/7/00
Fluoranthene	640	50.0		µg/Kg	1	9/7/00
Fluorene	85.0	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	395	50.0		µg/Kg	1	9/7/00
Naphthalene	580	50.0		µg/Kg	1	9/7/00
Phenanthrene	1,360	50.0		µg/Kg	1	9/7/00
Pyrene	715	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	103.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	99.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	112.0	23-120		%REC	1	9/7/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-23B

Client Sample ID: 2708-000828-023
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: Imc
Antimony	2.26	1.00		mg/Kg	1	9/6/00
Arsenic	3.14	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	70.9	1.00		mg/Kg	1	9/6/00
Copper	34.7	1.00		mg/Kg	1	9/6/00
Lead	30.4	1.00		mg/Kg	1	9/6/00
Nickel	146	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	114	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	60.0	50.0		µg/Kg	1	9/7/00
Acenaphthylene	175	50.0		µg/Kg	1	9/7/00
Anthracene	ND	50.0		µg/Kg	1	9/7/00
Benz(a)anthracene	1,240	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	1,740	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	1,600	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	1,820	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	1,020	50.0		µg/Kg	1	9/7/00
Chrysene	1,600	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	390	50.0		µg/Kg	1	9/7/00
Fluoranthene	2,780	50.0		µg/Kg	1	9/7/00
Fluorene	65.0	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	1,530	50.0		µg/Kg	1	9/7/00
Naphthalene	425	50.0		µg/Kg	1	9/7/00
Phenanthrene	2,020	50.0		µg/Kg	1	9/7/00
Pyrene	2,590	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	96.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	91.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	53.0	23-120		%REC	1	9/7/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 18-Oct-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-24A

Client Sample ID: 2708-000828-024
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: lmc
Mercury	ND	0.100		mg/Kg	1	10/17/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	ND	1.00		mg/Kg	1	10/17/00
Arsenic	2.57	1.00		mg/Kg	1	10/17/00
Beryllium	ND	1.00		mg/Kg	1	10/17/00
Cadmium	ND	1.00		mg/Kg	1	10/17/00
Chromium	12.9	1.00		mg/Kg	1	10/17/00
Copper	11.0	1.00		mg/Kg	1	10/17/00
Lead	2.40	1.00		mg/Kg	1	10/17/00
Nickel	14.8	1.00		mg/Kg	1	10/17/00
Selenium	ND	1.00		mg/Kg	1	10/17/00
Silver	ND	1.00		mg/Kg	1	10/17/00
Thallium	ND	100		mg/Kg	1	10/17/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limit
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 L - RI (only for accepted recovery limits)
 L - Value above quantitative range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-26B

Client Sample ID: 2708-000828-026
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				
Antimony	ND	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	ND	1.00		mg/Kg	1	9/6/00
Copper	3.83	1.00		mg/Kg	1	9/6/00
Lead	4.01	1.00		mg/Kg	1	9/6/00
Nickel	3.78	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	28.4	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				
Acenaphthene	ND	50.0		µg/Kg	1	9/8/00
Acenaphthylene	130	50.0		µg/Kg	1	9/8/00
Anthracene	320	50.0		µg/Kg	1	9/8/00
Benz(a)anthracene	850	50.0		µg/Kg	1	9/8/00
Benzo(a)pyrene	1,520	50.0		µg/Kg	1	9/8/00
Benzo(b)fluoranthene	1,350	50.0		µg/Kg	1	9/8/00
Benzo(g,h,i)perylene	1,140	50.0		µg/Kg	1	9/8/00
Benzo(k)fluoranthene	970	50.0		µg/Kg	1	9/8/00
Chrysene	1,500	50.0		µg/Kg	1	9/8/00
Dibenz(a,h)anthracene	245	50.0		µg/Kg	1	9/8/00
Fluoranthene	1,610	50.0		µg/Kg	1	9/8/00
Fluorene	ND	50.0		µg/Kg	1	9/8/00
Indeno(1,2,3-cd)pyrene	920	50.0		µg/Kg	1	9/8/00
Naphthalene	230	50.0		µg/Kg	1	9/8/00
Phenanthrene	825	50.0		µg/Kg	1	9/8/00
Pyrene	1,940	50.0		µg/Kg	1	9/8/00
Surr: 2-Fluorobiphenyl	107.0	30-115		%REC	1	9/8/00
Surr: 4-Terphenyl-d14	95.0	18-137		%REC	1	9/8/00
Surr: Nitrobenzene-d5	114.0	23-120		%REC	1	9/8/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-27B

Client Sample ID: 2708-000828-027
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	ND	1.00		mg/Kg	1	9/6/00
Arsenic	2.54	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	11.8	1.00		mg/Kg	1	9/6/00
Copper	11.8	1.00		mg/Kg	1	9/6/00
Lead	1.78	1.00		mg/Kg	1	9/6/00
Nickel	14.3	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	35.9	1.00		mg/Kg	1	9/6/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-30B

Client Sample ID: 2708-000828-030
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				
Antimony	1.57	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	5.01	1.00		mg/Kg	1	9/6/00
Copper	12.9	1.00		mg/Kg	1	9/6/00
Lead	3.78	1.00		mg/Kg	1	9/6/00
Nickel	5.44	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	54.4	1.00		mg/Kg	1	9/6/00

Analyst: cms

Analyst: Imc

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-31A

Client Sample ID: 2708-000828-031
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	107,000	3,210		µg/Kg-dry	1000	9/5/00
Ethylbenzene	103,000	3,210		µg/Kg-dry	1000	9/5/00
Toluene	78,100	3,210		µg/Kg-dry	1000	9/5/00
Xylenes, Total	141,000	9,620		µg/Kg-dry	1000	9/5/00
Surr: Trifluorotoluene	00.0	70-130	X	%REC	1000	9/5/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	22.0	0		wt%	1	9/1/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-31B

Client Sample ID: 2708-000828-031
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: Imc
Antimony	1.03	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	8.86	1.00		mg/Kg	1	9/6/00
Copper	9.23	1.00		mg/Kg	1	9/6/00
Lead	18.3	1.00		mg/Kg	1	9/6/00
Nickel	11.1	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	43.4	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	72.5	5.00		µg/Kg	100	9/10/00
Acenaphthylene	47.5	5.00		µg/Kg	100	9/10/00
Anthracene	59.0	5.00		µg/Kg	100	9/10/00
Benz(a)anthracene	42.5	5.00		µg/Kg	100	9/10/00
Benzo(a)pyrene	47.5	5.00		µg/Kg	100	9/10/00
Benzo(b)fluoranthene	25.5	5.00		µg/Kg	100	9/10/00
Benzo(g,h,i)perylene	36.5	5.00		µg/Kg	100	9/10/00
Benzo(k)fluoranthene	28.5	5.00		µg/Kg	100	9/10/00
Chrysene	53.5	5.00		µg/Kg	100	9/10/00
Dibenz(a,h)anthracene	5.50	5.00		µg/Kg	100	9/10/00
Fluoranthene	146	5.00		µg/Kg	100	9/10/00
Fluorene	54.5	5.00		µg/Kg	100	9/10/00
Indeno(1,2,3-cd)pyrene	27.0	5.00		µg/Kg	100	9/10/00
Naphthalene	835	5.00		µg/Kg	100	9/10/00
Phenanthrene	302	5.00		µg/Kg	100	9/10/00
Pyrene	164	5.00		µg/Kg	100	9/10/00
Surr: 2-Fluorobiphenyl	00.0	30-115	S	%REC	100	9/10/00
Surr: 4-Terphenyl-d14	00.0	18-137	S	%REC	100	9/10/00
Surr: Nitrobenzene-d5	00.0	23-120	S	%REC	100	9/10/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-32A

Client Sample ID: 2708-000828-032
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	6,800	2,810		µg/Kg-dry	1000	9/5/00
Ethylbenzene	15,600	2,810		µg/Kg-dry	1000	9/5/00
Toluene	8,260	2,810		µg/Kg-dry	1000	9/5/00
Xylenes, Total	19,800	8,430		µg/Kg-dry	1000	9/5/00
Surr: Trifluorotoluene	00.0	70-130	X	%REC	1000	9/5/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	11.0	0		wt%	1	9/1/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-32B

Client Sample ID: 2708-000828-032
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	114	5.00		µg/Kg	100	9/10/00
Acenaphthylene	30.0	5.00		µg/Kg	100	9/10/00
Anthracene	77.5	5.00		µg/Kg	100	9/10/00
Benz(a)anthracene	77.0	5.00		µg/Kg	100	9/10/00
Benzo(a)pyrene	88.0	5.00		µg/Kg	100	9/10/00
Benzo(b)fluoranthene	54.5	5.00		µg/Kg	100	9/10/00
Benzo(g,h,i)perylene	65.0	5.00		µg/Kg	100	9/10/00
Benzo(k)fluoranthene	51.0	5.00		µg/Kg	100	9/10/00
Chrysene	92.0	5.00		µg/Kg	100	9/10/00
Dibenz(a,h)anthracene	11.0	5.00		µg/Kg	100	9/10/00
Fluoranthene	212	5.00		µg/Kg	100	9/10/00
Fluorene	65.0	5.00		µg/Kg	100	9/10/00
Indeno(1,2,3-cd)pyrene	51.0	5.00		µg/Kg	100	9/10/00
Naphthalene	755	5.00		µg/Kg	100	9/10/00
Phenanthrene	386	5.00		µg/Kg	100	9/10/00
Pyrene	258	5.00		µg/Kg	100	9/10/00
Surr: 2-Fluorobiphenyl	00.0	30-115	S	%REC	100	9/10/00
Surr: 4-Terphenyl-d14	00.0	18-137	S	%REC	100	9/10/00
Surr: Nitrobenzene-d5	00.0	23-120	S	%REC	100	9/10/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-33B

Client Sample ID: 2708-000828-033
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.87	1.00		mg/Kg	1	9/6/00
Arsenic	1.11	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	11.9	1.00		mg/Kg	1	9/6/00
Copper	16.7	1.00		mg/Kg	1	9/6/00
Lead	10.8	1.00		mg/Kg	1	9/6/00
Nickel	5.92	1.00		mg/Kg	1	9/6/00
Selenium	ND	10.0		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	100		mg/Kg	1	9/6/00
Zinc	67.2	1.00		mg/Kg	1	9/6/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-34A

Client Sample ID: 2708-000828-034
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	14,300	3,250		µg/Kg-dry	1000	9/5/00
Ethylbenzene	21,200	3,250		µg/Kg-dry	1000	9/5/00
Toluene	5,680	3,250		µg/Kg-dry	1000	9/5/00
Xylenes, Total	43,900	9,740		µg/Kg-dry	1000	9/5/00
Surr: Trifluorotoluene	00.0	70-130	X	%REC	1000	9/5/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	23.0	0		wt%	1	9/1/00

Qualifiers:

ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits
J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank	E - Value above quantitation range
* - Value exceeds Maximum Contaminant Level	

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-34B

Client Sample ID: 2708-000828-034
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.52	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	10.2	1.00		mg/Kg	1	9/6/00
Copper	10.7	1.00		mg/Kg	1	9/6/00
Lead	11.1	1.00		mg/Kg	1	9/6/00
Nickel	8.65	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	62.6	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	145	5.00		µg/Kg	100	9/10/00
Acenaphthylene	16.0	5.00		µg/Kg	100	9/10/00
Anthracene	86.0	5.00		µg/Kg	100	9/10/00
Benz(a)anthracene	69.0	5.00		µg/Kg	100	9/10/00
Benzo(a)pyrene	76.5	5.00		µg/Kg	100	9/10/00
Benzo(b)fluoranthene	41.5	5.00		µg/Kg	100	9/10/00
Benzo(g,h,i)perylene	58.0	5.00		µg/Kg	100	9/10/00
Benzo(k)fluoranthene	44.0	5.00		µg/Kg	100	9/10/00
Chrysene	86.0	5.00		µg/Kg	100	9/10/00
Dibenz(a,h)anthracene	9.00	5.00		µg/Kg	100	9/10/00
Fluoranthene	220	5.00		µg/Kg	100	9/10/00
Fluorene	82.0	5.00		µg/Kg	100	9/10/00
Indeno(1,2,3-cd)pyrene	43.5	5.00		µg/Kg	100	9/10/00
Naphthalene	760	5.00		µg/Kg	100	9/10/00
Phenanthrene	434	5.00		µg/Kg	100	9/10/00
Pyrene	254	5.00		µg/Kg	100	9/10/00
Surr: 2-Fluorobiphenyl	00.0	30-115	S	%REC	100	9/10/00
Surr: 4-Terphenyl-d14	00.0	18-137	S	%REC	100	9/10/00
Surr: Nitrobenzene-d5	00.0	23-120	S	%REC	100	9/10/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-35A

Client Sample ID: 2708-000828-035
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	11,600	3,330		µg/Kg-dry	1000	9/5/00
Ethylbenzene	27,200	3,330		µg/Kg-dry	1000	9/5/00
Toluene	ND	3,330		µg/Kg-dry	1000	9/5/00
Xylenes, Total	31,500	10,000		µg/Kg-dry	1000	9/5/00
Surr: Trifluorotoluene	00.0	70-130	X	%REC	1000	9/5/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	25.0	0		wt%	1	9/1/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-35B

Client Sample ID: 2708-000828-035
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.59	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	10.0	1.00		mg/Kg	1	9/6/00
Copper	10.4	1.00		mg/Kg	1	9/6/00
Lead	12.6	1.00		mg/Kg	1	9/6/00
Nickel	10.1	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	100		mg/Kg	1	9/6/00
Zinc	61.4	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	344	5.00		µg/Kg	100	9/10/00
Acenaphthylene	330	5.00		µg/Kg	100	9/10/00
Anthracene	342	5.00		µg/Kg	100	9/10/00
Benzo(a)anthracene	244	5.00		µg/Kg	100	9/10/00
Benzo(a)pyrene	259	5.00		µg/Kg	100	9/10/00
Benzo(b)fluoranthene	150	5.00		µg/Kg	100	9/10/00
Benzo(g,h,i)perylene	207	5.00		µg/Kg	100	9/10/00
Benzo(k)fluoranthene	142	5.00		µg/Kg	100	9/10/00
Chrysene	284	5.00		µg/Kg	100	9/10/00
Dibenz(a,h)anthracene	33.5	5.00		µg/Kg	100	9/10/00
Fluoranthene	875	5.00		µg/Kg	100	9/10/00
Fluorene	310	5.00		µg/Kg	100	9/10/00
Indeno(1,2,3-cd)pyrene	160	5.00		µg/Kg	100	9/10/00
Naphthalene	4,100	5.00		µg/Kg	100	9/10/00
Phenanthrene	1,810	5.00		µg/Kg	100	9/10/00
Pyrene	995	5.00		µg/Kg	100	9/10/00
Surr: 2-Fluorobiphenyl	00.0	30-115	S	%REC	100	9/10/00
Surr: 4-Terphenyl-d14	00.0	18-137	S	%REC	100	9/10/00
Surr: Nitrobenzene-d5	00.0	23-120	S	%REC	100	9/10/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-36B

Client Sample ID: 2708-000828-036
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.62	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	9.26	1.00		mg/Kg	1	9/6/00
Copper	9.62	1.00		mg/Kg	1	9/6/00
Lead	6.93	1.00		mg/Kg	1	9/6/00
Nickel	4.70	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	100		mg/Kg	1	9/6/00
Zinc	63.9	1.00		mg/Kg	1	9/6/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-37A

Client Sample ID: 2708-000828-037
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	3.01		µg/Kg-dry	1	9/5/00
Ethylbenzene	ND	3.01		µg/Kg-dry	1	9/5/00
Toluene	ND	3.01		µg/Kg-dry	1	9/5/00
Xylenes, Total	ND	9.04		µg/Kg-dry	1	9/5/00
Surr: Trifluorotoluene	102.0	70-130		%REC	1	9/5/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	17.0	0		wt%	1	9/1/00

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-37B

Client Sample ID: 2708-000828-037
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.54	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	10.6	1.00		mg/Kg	1	9/6/00
Copper	9.90	1.00		mg/Kg	1	9/6/00
Lead	6.68	1.00		mg/Kg	1	9/6/00
Nickel	6.90	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	53.0	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	650	500		µg/Kg	10	9/9/00
Acenaphthylene	12,500	500		µg/Kg	10	9/9/00
Anthracene	2,100	500		µg/Kg	10	9/9/00
Benz(a)anthracene	28,500	500		µg/Kg	10	9/9/00
Benzo(a)pyrene	114,000	500		µg/Kg	10	9/9/00
Benzo(b)fluoranthene	66,000	500		µg/Kg	10	9/9/00
Benzo(g,h,i)perylene	105,000	500		µg/Kg	10	9/9/00
Benzo(k)fluoranthene	40,000	500		µg/Kg	10	9/9/00
Chrysene	39,400	500		µg/Kg	10	9/9/00
Dibenz(a,h)anthracene	9,400	500		µg/Kg	10	9/9/00
Fluoranthene	22,800	500		µg/Kg	10	9/9/00
Fluorene	ND	500		µg/Kg	10	9/9/00
Indeno(1,2,3-cd)pyrene	46,100	500		µg/Kg	10	9/9/00
Naphthalene	6,200	500		µg/Kg	10	9/9/00
Phenanthrene	8,950	500		µg/Kg	10	9/9/00
Pyrene	60,500	500		µg/Kg	10	9/9/00
Surr: 2-Fluorobiphenyl	100.0	30-115		%REC	10	9/9/00
Surr: 4-Terphenyl-d14	120.0	18-137		%REC	10	9/9/00
Surr: Nitrobenzene-d5	90.0	23-120		%REC	10	9/9/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-38A

Client Sample ID: 2708-000828-038
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	1,780	658		µg/Kg-dry	1000	9/5/00
Ethylbenzene	18,000	658		µg/Kg-dry	1000	9/5/00
Toluene	895	658		µg/Kg-dry	1000	9/5/00
Xylenes, Total	24,500	1,970		µg/Kg-dry	1000	9/5/00
Surr: Trifluorotoluene	00.0	70-130	X	%REC	1000	9/5/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	24.0	0		wt%	1	9/5/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-38B

Client Sample ID: 2708-000828-038
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	199	5.00		µg/Kg	100	9/10/00
Acenaphthylene	43.0	5.00		µg/Kg	100	9/10/00
Anthracene	121	5.00		µg/Kg	100	9/10/00
Benz(a)anthracene	116	5.00		µg/Kg	100	9/10/00
Benzo(a)pyrene	132	5.00		µg/Kg	100	9/10/00
Benzo(b)fluoranthene	77.0	5.00		µg/Kg	100	9/10/00
Benzo(g,h,i)perylene	106	5.00		µg/Kg	100	9/10/00
Benzo(k)fluoranthene	71.5	5.00		µg/Kg	100	9/10/00
Chrysene	140	5.00		µg/Kg	100	9/10/00
Dibenz(a,h)anthracene	17.0	5.00		µg/Kg	100	9/10/00
Fluoranthene	334	5.00		µg/Kg	100	9/10/00
Fluorene	121	5.00		µg/Kg	100	9/10/00
Indeno(1,2,3-cd)pyrene	80.5	5.00		µg/Kg	100	9/10/00
Naphthalene	1,300	5.00		µg/Kg	100	9/10/00
Phenanthrene	750	5.00		µg/Kg	100	9/10/00
Pyrene	384	5.00		µg/Kg	100	9/10/00
Surr: 2-Fluorobiphenyl	00.0	30-115	S	%REC	100	9/10/00
Surr: 4-Terphenyl-d14	00.0	18-137	S	%REC	100	9/10/00
Surr: Nitrobenzene-d5	00.0	23-120	S	%REC	100	9/10/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-39B

Client Sample ID: 2708-000828-039
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: Imc
Antimony	1.57	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	1.80	1.00		mg/Kg	1	9/6/00
Copper	5.87	1.00		mg/Kg	1	9/6/00
Lead	ND	1.00		mg/Kg	1	9/6/00
Nickel	1.10	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	33.4	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	ND	50.0		µg/Kg	1	9/7/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/7/00
Anthracene	ND	50.0		µg/Kg	1	9/7/00
Benz(a)anthracene	300	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	445	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	445	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	480	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	315	50.0		µg/Kg	1	9/7/00
Chrysene	365	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	135	50.0		µg/Kg	1	9/7/00
Fluoranthene	455	50.0		µg/Kg	1	9/7/00
Fluorene	ND	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	385	50.0		µg/Kg	1	9/7/00
Naphthalene	ND	50.0		µg/Kg	1	9/7/00
Phenanthrene	180	50.0		µg/Kg	1	9/7/00
Pyrene	425	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	98.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	93.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	101.0	23-120		%REC	1	9/7/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-40B

Client Sample ID: 2708-000828-040
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: Imc
Antimony	1.42	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	2.46	1.00		mg/Kg	1	9/6/00
Copper	5.92	1.00		mg/Kg	1	9/6/00
Lead	ND	1.00		mg/Kg	1	9/6/00
Nickel	1.95	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	35.5	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: ams
Acenaphthene	ND	50.0		µg/Kg	1	9/5/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/5/00
Anthracene	ND	50.0		µg/Kg	1	9/5/00
Benzo(a)anthracene	ND	50.0		µg/Kg	1	9/5/00
Benzo(a)pyrene	ND	50.0		µg/Kg	1	9/5/00
Benzo(b)fluoranthene	ND	50.0		µg/Kg	1	9/5/00
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	9/5/00
Benzo(k)fluoranthene	55.0	50.0		µg/Kg	1	9/5/00
Chrysene	ND	50.0		µg/Kg	1	9/5/00
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	9/5/00
Fluoranthene	ND	50.0		µg/Kg	1	9/5/00
Fluorene	ND	50.0		µg/Kg	1	9/5/00
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	9/5/00
Naphthalene	ND	50.0		µg/Kg	1	9/5/00
Phenanthrene	ND	50.0		µg/Kg	1	9/5/00
Pyrene	ND	50.0		µg/Kg	1	9/5/00
Surr: 2-Fluorobiphenyl	105.0	30-115		%REC	1	9/5/00
Surr: 4-Terphenyl-d14	105.0	18-137		%REC	1	9/5/00
Surr: Nitrobenzene-d5	91.0	23-120		%REC	1	9/5/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-41A

Client Sample ID: 2708-000828-041
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	3.01		µg/Kg-dry	1	9/5/00
Ethylbenzene	ND	3.01		µg/Kg-dry	1	9/5/00
Toluene	ND	3.01		µg/Kg-dry	1	9/5/00
Xylenes, Total	ND	9.04		µg/Kg-dry	1	9/5/00
Surr: Trifluorotoluene	103.0	70-130		%REC	1	9/5/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	17.0	0		wt%	1	9/5/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-41B

Client Sample ID: 2708-000828-041
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.02	1.00		mg/Kg	1	9/6/00
Arsenic	5.25	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	16.1	1.00		mg/Kg	1	9/6/00
Copper	19.6	1.00		mg/Kg	1	9/6/00
Lead	12.1	1.00		mg/Kg	1	9/6/00
Nickel	13.5	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	55.2	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	1,650	50.0		µg/Kg	1	9/9/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/9/00
Anthracene	2,140	50.0		µg/Kg	1	9/9/00
Benz(a)anthracene	8,700	50.0		µg/Kg	1	9/9/00
Benzo(a)pyrene	11,400	50.0		µg/Kg	1	9/9/00
Benzo(b)fluoranthene	8,450	50.0		µg/Kg	1	9/9/00
Benzo(g,h,i)perylene	8,050	50.0		µg/Kg	1	9/9/00
Benzo(k)fluoranthene	7,850	50.0		µg/Kg	1	9/9/00
Chrysene	9,450	50.0		µg/Kg	1	9/9/00
Dibenz(a,h)anthracene	1,140	50.0		µg/Kg	1	9/9/00
Fluoranthene	15,600	50.0		µg/Kg	1	9/9/00
Fluorene	675	50.0		µg/Kg	1	9/9/00
Indeno(1,2,3-cd)pyrene	7,100	50.0		µg/Kg	1	9/9/00
Naphthalene	85.0	50.0		µg/Kg	1	9/9/00
Phenanthrene	8,500	50.0		µg/Kg	1	9/9/00
Pyrene	15,100	50.0		µg/Kg	1	9/9/00
Surr: 2-Fluorobiphenyl	98.0	30-115		%REC	1	9/9/00
Surr: 4-Terphenyl-d14	89.0	18-137		%REC	1	9/9/00
Surr: Nitrobenzene-d5	110.0	23-120		%REC	1	9/9/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-42A

Client Sample ID: 2708-000828-042
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.98		µg/Kg-dry	1	9/6/00
Ethylbenzene	ND	2.98		µg/Kg-dry	1	9/6/00
Toluene	ND	2.98		µg/Kg-dry	1	9/6/00
Xylenes, Total	ND	8.93		µg/Kg-dry	1	9/6/00
Surr: Trifluorotoluene	95.4	70-130		%REC	1	9/6/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	16.0	0		wt%	1	9/5/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-42B

Client Sample ID: 2708-000828-042
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	2.00	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.07	1.00		mg/Kg	1	9/6/00
Arsenic	2.67	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	13.9	1.00		mg/Kg	1	9/6/00
Copper	17.6	1.00		mg/Kg	1	9/6/00
Lead	14.6	1.00		mg/Kg	1	9/6/00
Nickel	14.7	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	53.0	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	59.5	5.00		µg/Kg	100	9/10/00
Acenaphthylene	ND	5.00		µg/Kg	100	9/10/00
Anthracene	76.5	5.00		µg/Kg	100	9/10/00
Benz(a)anthracene	42.0	5.00		µg/Kg	100	9/10/00
Benzo(a)pyrene	40.0	5.00		µg/Kg	100	9/10/00
Benzo(b)fluoranthene	27.5	5.00		µg/Kg	100	9/10/00
Benzo(g,h,i)perylene	23.5	5.00		µg/Kg	100	9/10/00
Benzo(k)fluoranthene	29.0	5.00		µg/Kg	100	9/10/00
Chrysene	45.5	5.00		µg/Kg	100	9/10/00
Dibenz(a,h)anthracene	8.00	5.00		µg/Kg	100	9/10/00
Fluoranthene	136	5.00		µg/Kg	100	9/10/00
Fluorene	42.0	5.00		µg/Kg	100	9/10/00
Indeno(1,2,3-cd)pyrene	21.5	5.00		µg/Kg	100	9/10/00
Naphthalene	12.0	5.00		µg/Kg	100	9/10/00
Phenanthrene	166	5.00		µg/Kg	100	9/10/00
Pyrene	112	5.00		µg/Kg	100	9/10/00
Surr: 2-Fluorobiphenyl	00.0	30-115	S	%REC	100	9/10/00
Surr: 4-Terphenyl-d14	00.0	18-137	S	%REC	100	9/10/00
Surr: Nitrobenzene-d5	00.0	23-120	S	%REC	100	9/10/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-43A

Client Sample ID: 2708-000828-043
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	3.09		µg/Kg-dry	1	9/5/00
Ethylbenzene	ND	3.09		µg/Kg-dry	1	9/5/00
Toluene	ND	3.09		µg/Kg-dry	1	9/5/00
Xylenes, Total	ND	9.26		µg/Kg-dry	1	9/5/00
Surr: Trifluorotoluene	101.0	70-130		%REC	1	9/5/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	19.0	0		wt%	1	9/5/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-43B

Client Sample ID: 2708-000828-043
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	ND	1.00		mg/Kg	1	9/6/00
Arsenic	3.33	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	15.1	1.00		mg/Kg	1	9/6/00
Copper	19.4	1.00		mg/Kg	1	9/6/00
Lead	11.9	1.00		mg/Kg	1	9/6/00
Nickel	12.2	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	52.5	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	100	5.00		µg/Kg	100	9/10/00
Acenaphthylene	ND	5.00		µg/Kg	100	9/10/00
Anthracene	108	5.00		µg/Kg	100	9/10/00
Benzo(a)anthracene	146	5.00		µg/Kg	100	9/10/00
Benzo(a)pyrene	176	5.00		µg/Kg	100	9/10/00
Benzo(b)fluoranthene	132	5.00		µg/Kg	100	9/10/00
Benzo(g,h,i)perylene	120	5.00		µg/Kg	100	9/10/00
Benzo(k)fluoranthene	127	5.00		µg/Kg	100	9/10/00
Chrysene	156	5.00		µg/Kg	100	9/10/00
Dibenz(a,h)anthracene	30.0	5.00		µg/Kg	100	9/10/00
Fluoranthene	306	5.00		µg/Kg	100	9/10/00
Fluorene	69.0	5.00		µg/Kg	100	9/10/00
Indeno(1,2,3-cd)pyrene	108	5.00		µg/Kg	100	9/10/00
Naphthalene	87.0	5.00		µg/Kg	100	9/10/00
Phenanthrene	332	5.00		µg/Kg	100	9/10/00
Pyrene	280	5.00		µg/Kg	100	9/10/00
Surr: 2-Fluorobiphenyl	00.0	30-115	S	%REC	100	9/10/00
Surr: 4-Terphenyl-d14	00.0	18-137	S	%REC	100	9/10/00
Surr: Nitrobenzene-d5	00.0	23-120	S	%REC	100	9/10/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-45A

Client Sample ID: 2708-000828-045
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.94		µg/Kg-dry	1	9/5/00
Ethylbenzene	16.8	2.94		µg/Kg-dry	1	9/5/00
Toluene	4.26	2.94		µg/Kg-dry	1	9/5/00
Xylenes, Total	61.6	8.82		µg/Kg-dry	1	9/5/00
Surr: Trifluorotoluene	96.6	70-130		%REC	1	9/5/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	15.0	0		wt%	1	9/5/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-45B

Client Sample ID: 2708-000828-045
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	9.95	0.500		µg/Kg	10	9/10/00
Acenaphthylene	1.75	0.500		µg/Kg	10	9/10/00
Anthracene	6.25	0.500		µg/Kg	10	9/10/00
Benz(a)anthracene	8.20	0.500		µg/Kg	10	9/10/00
Benzo(a)pyrene	12.0	0.500		µg/Kg	10	9/10/00
Benzo(b)fluoranthene	7.65	0.500		µg/Kg	10	9/10/00
Benzo(g,h,i)perylene	10.8	0.500		µg/Kg	10	9/10/00
Benzo(k)fluoranthene	6.85	0.500		µg/Kg	10	9/10/00
Chrysene	10.1	0.500		µg/Kg	10	9/10/00
Dibenz(a,h)anthracene	1.60	0.500		µg/Kg	10	9/10/00
Fluoranthene	25.8	0.500		µg/Kg	10	9/10/00
Fluorene	4.95	0.500		µg/Kg	10	9/10/00
Indeno(1,2,3-cd)pyrene	8.15	0.500		µg/Kg	10	9/10/00
Naphthalene	14.2	0.500		µg/Kg	10	9/10/00
Phenanthrene	24.7	0.500		µg/Kg	10	9/10/00
Pyrene	28.4	0.500		µg/Kg	10	9/10/00
Surr: 2-Fluorobiphenyl	00.1	30-115		%REC	10	9/10/00
Surr: 4-Terphenyl-d14	00.1	18-137		%REC	10	9/10/00
Surr: Nitrobenzene-d5	00.1	23-120		%REC	10	9/10/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-46A

Client Sample ID: 2708-000828-046
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.66		µg/Kg-dry	1	9/6/00
Ethylbenzene	ND	2.66		µg/Kg-dry	1	9/6/00
Toluene	ND	2.66		µg/Kg-dry	1	9/6/00
Xylenes, Total	ND	7.98		µg/Kg-dry	1	9/6/00
Surr: Trifluorotoluene	101.0	70-130		%REC	1	9/6/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	6.00	0		wt%	1	9/5/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-46B

Client Sample ID: 2708-000828-046
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY						
		EPA 7471A				
Mercury	0.105	0.100		mg/Kg	1	9/6/00
Analyst: cms						
ICP METALS						
		EPA 6010B				
Antimony	ND	1.00		mg/Kg	1	9/6/00
Arsenic	2.89	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	11.4	1.00		mg/Kg	1	9/6/00
Copper	11.8	1.00		mg/Kg	1	9/6/00
Lead	2.44	1.00		mg/Kg	1	9/6/00
Nickel	17.3	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	35.9	1.00		mg/Kg	1	9/6/00
Analyst: lmc						
PAH BY SIM, SOIL						
		8270-SIM				
Acenaphthene	ND	50.0		µg/Kg	1	9/7/00
Acenaphthylene	165	50.0		µg/Kg	1	9/7/00
Anthracene	ND	50.0		µg/Kg	1	9/7/00
Benz(a)anthracene	355	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	1,260	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	950	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	3,280	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	565	50.0		µg/Kg	1	9/7/00
Chrysene	595	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	345	50.0		µg/Kg	1	9/7/00
Fluoranthene	490	50.0		µg/Kg	1	9/7/00
Fluorene	ND	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	2,090	50.0		µg/Kg	1	9/7/00
Naphthalene	100	50.0		µg/Kg	1	9/7/00
Phenanthrene	105	50.0		µg/Kg	1	9/7/00
Pyrene	535	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	99.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	96.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	107.0	23-120		%REC	1	9/7/00
Analyst: keh						

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-47A

Client Sample ID: 2708-000828-047
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.69		µg/Kg-dry	1	9/6/00
Ethylbenzene	ND	2.69		µg/Kg-dry	1	9/6/00
Toluene	ND	2.69		µg/Kg-dry	1	9/6/00
Xylenes, Total	ND	8.06		µg/Kg-dry	1	9/6/00
Surr: Trifluorotoluene	100.0	70-130		%REC	1	9/6/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	7.00	0		wt%	1	9/5/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-47B

Client Sample ID: 2708-000828-047
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY						
		EPA 7471A				
Mercury	ND	0.100		mg/Kg	1	9/6/00
Analyst: cms						
ICP METALS						
		EPA 6010B				
Antimony	ND	1.00		mg/Kg	1	9/6/00
Analyst: lmc						
Arsenic	2.93	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	12.3	1.00		mg/Kg	1	9/6/00
Copper	11.8	1.00		mg/Kg	1	9/6/00
Lead	1.97	1.00		mg/Kg	1	9/6/00
Nickel	15.5	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	36.8	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL						
		8270-SIM				
Analyst: keh						
Acenaphthene	ND	50.0		µg/Kg	1	9/7/00
Acenaphthylene	110	50.0		µg/Kg	1	9/7/00
Anthracene	ND	50.0		µg/Kg	1	9/7/00
Benz(a)anthracene	160	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	595	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	545	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	1,030	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	315	50.0		µg/Kg	1	9/7/00
Chrysene	275	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	160	50.0		µg/Kg	1	9/7/00
Fluoranthene	125	50.0		µg/Kg	1	9/7/00
Fluorene	ND	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	750	50.0		µg/Kg	1	9/7/00
Naphthalene	ND	50.0		µg/Kg	1	9/7/00
Phenanthrene	ND	50.0		µg/Kg	1	9/7/00
Pyrene	170	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	103.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	92.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	115.0	23-120		%REC	1	9/7/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-48A

Client Sample ID: 2708-000828-048
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.75		µg/Kg-dry	1	9/6/00
Ethylbenzene	ND	2.75		µg/Kg-dry	1	9/6/00
Toluene	ND	2.75		µg/Kg-dry	1	9/6/00
Xylenes, Total	ND	8.24		µg/Kg-dry	1	9/6/00
Surr: Trifluorotoluene	97.6	70-130		%REC	1	9/6/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	9.00	0		wt%	1	9/5/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-48B

Client Sample ID: 2708-000828-048
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	10,200	500		µg/Kg	10	9/9/00
Acenaphthylene	ND	500		µg/Kg	10	9/9/00
Anthracene	14,200	500		µg/Kg	10	9/9/00
Benz(a)anthracene	125	5.00		µg/Kg	100	9/10/00
Benzo(a)pyrene	171	5.00		µg/Kg	100	9/10/00
Benzo(b)fluoranthene	146	5.00		µg/Kg	100	9/10/00
Benzo(g,h,i)perylene	132	5.00		µg/Kg	100	9/10/00
Benzo(k)fluoranthene	118	5.00		µg/Kg	100	9/10/00
Chrysene	138	5.00		µg/Kg	100	9/10/00
Dibenz(a,h)anthracene	25,000	500		µg/Kg	10	9/9/00
Fluoranthene	172	5.00		µg/Kg	100	9/10/00
Fluorene	5,150	500		µg/Kg	10	9/9/00
Indeno(1,2,3-cd)pyrene	120	5.00		µg/Kg	100	9/10/00
Naphthalene	1,200	500		µg/Kg	10	9/9/00
Phenanthrene	75.0	5.00		µg/Kg	100	9/10/00
Pyrene	158	5.00		µg/Kg	100	9/10/00
Surr: 2-Fluorobiphenyl	80.0	30-115		%REC	10	9/9/00
Surr: 4-Terphenyl-d14	90.0	18-137		%REC	10	9/9/00
Surr: Nitrobenzene-d5	120.0	23-120		%REC	10	9/9/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-49A

Client Sample ID: 2708-000828-049
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.75		µg/Kg-dry	1	9/6/00
Ethylbenzene	ND	2.75		µg/Kg-dry	1	9/6/00
Toluene	ND	2.75		µg/Kg-dry	1	9/6/00
Xylenes, Total	ND	8.24		µg/Kg-dry	1	9/6/00
Surr: Trifluorotoluene	97.0	70-130		%REC	1	9/6/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	9.00	0		wt%	1	9/5/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-49B

Client Sample ID: 2708-000828-049
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	2,500	500		µg/Kg	10	9/9/00
Acenaphthylene	ND	500		µg/Kg	10	9/9/00
Anthracene	4,000	500		µg/Kg	10	9/9/00
Benzo(a)anthracene	27,400	500		µg/Kg	10	9/9/00
Benzo(a)pyrene	40,400	500		µg/Kg	10	9/9/00
Benzo(b)fluoranthene	35,200	500		µg/Kg	10	9/9/00
Benzo(g,h,i)perylene	19,800	500		µg/Kg	10	9/9/00
Benzo(k)fluoranthene	28,000	500		µg/Kg	10	9/9/00
Chrysene	29,000	500		µg/Kg	10	9/9/00
Dibenz(a,h)anthracene	6,150	500		µg/Kg	10	9/9/00
Fluoranthene	39,200	500		µg/Kg	10	9/9/00
Fluorene	1,150	500		µg/Kg	10	9/9/00
Indeno(1,2,3-cd)pyrene	18,600	500		µg/Kg	10	9/9/00
Naphthalene	ND	500		µg/Kg	10	9/9/00
Phenanthrene	18,800	500		µg/Kg	10	9/9/00
Pyrene	46,400	500		µg/Kg	10	9/9/00
Surr: 2-Fluorobiphenyl	90.0	30-115		%REC	10	9/9/00
Surr: 4-Terphenyl-d14	120.0	18-137		%REC	10	9/9/00
Surr: Nitrobenzene-d5	90.0	23-120		%REC	10	9/9/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-50B

Client Sample ID: 2708-000828-050
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	3.23	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	3.76	1.00		mg/Kg	1	9/6/00
Arsenic	3.04	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	22.3	1.00		mg/Kg	1	9/6/00
Copper	40.9	1.00		mg/Kg	1	9/6/00
Lead	94.6	1.00		mg/Kg	1	9/6/00
Nickel	19.8	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	226	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	110,000	5,000		µg/Kg	10	9/9/00
Acenaphthylene	ND	5,000		µg/Kg	10	9/9/00
Anthracene	139,000	5,000		µg/Kg	10	9/9/00
Benz(a)anthracene	1,490	50.0		µg/Kg	100	9/10/00
Benzo(a)pyrene	2,020	50.0		µg/Kg	100	9/10/00
Benzo(b)fluoranthene	1,760	50.0		µg/Kg	100	9/10/00
Benzo(g,h,i)perylene	1,600	50.0		µg/Kg	100	9/10/00
Benzo(k)fluoranthene	1,460	50.0		µg/Kg	100	9/10/00
Chrysene	1,650	50.0		µg/Kg	100	9/10/00
Dibenz(a,h)anthracene	500	50.0		µg/Kg	100	9/10/00
Fluoranthene	1,980	50.0		µg/Kg	100	9/10/00
Fluorene	55,000	5,000		µg/Kg	10	9/9/00
Indeno(1,2,3-cd)pyrene	1,460	50.0		µg/Kg	100	9/10/00
Naphthalene	11,000	5,000		µg/Kg	10	9/9/00
Phenanthrene	825	50.0		µg/Kg	100	9/10/00
Pyrene	1,860	50.0		µg/Kg	100	9/10/00
Surr: 2-Fluorobiphenyl	90.0	30-115		%REC	10	9/9/00
Surr: 4-Terphenyl-d14	110.0	18-137		%REC	10	9/9/00
Surr: Nitrobenzene-d5	90.0	23-120		%REC	10	9/9/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-51A

Client Sample ID: 2708-000828-051
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.63		µg/Kg-dry	1	9/6/00
Ethylbenzene	ND	2.63		µg/Kg-dry	1	9/6/00
Toluene	ND	2.63		µg/Kg-dry	1	9/6/00
Xylenes, Total	ND	7.89		µg/Kg-dry	1	9/6/00
Surr: Trifluorotoluene	102.0	70-130		%REC	1	9/6/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	5.00	0		wt%	1	9/5/00

Qualifiers:

ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits
J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank	E - Value above quantitation range
* - Value exceeds Maximum Contaminant Level	

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-51B

Client Sample ID: 2708-000828-051
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	ND	1.00		mg/Kg	1	9/6/00
Arsenic	2.46	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	10.8	1.00		mg/Kg	1	9/6/00
Copper	11.9	1.00		mg/Kg	1	9/6/00
Lead	1.70	1.00		mg/Kg	1	9/6/00
Nickel	13.8	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	36.1	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	ND	50.0		µg/Kg	1	9/7/00
Acenaphthylene	140	50.0		µg/Kg	1	9/7/00
Anthracene	ND	50.0		µg/Kg	1	9/7/00
Benz(a)anthracene	500	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	1,320	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	1,000	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	1,550	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	595	50.0		µg/Kg	1	9/7/00
Chrysene	755	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	245	50.0		µg/Kg	1	9/7/00
Fluoranthene	530	50.0		µg/Kg	1	9/7/00
Fluorene	ND	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	1,110	50.0		µg/Kg	1	9/7/00
Naphthalene	ND	50.0		µg/Kg	1	9/7/00
Phenanthrene	ND	50.0		µg/Kg	1	9/7/00
Pyrene	715	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	95.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	89.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	96.0	23-120		%REC	1	9/7/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-52B

Client Sample ID: 2708-000828-052
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: Imc
Antimony	ND	1.00		mg/Kg	1	9/6/00
Arsenic	3.40	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	12.6	1.00		mg/Kg	1	9/6/00
Copper	12.5	1.00		mg/Kg	1	9/6/00
Lead	1.76	1.00		mg/Kg	1	9/6/00
Nickel	14.6	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	37.9	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	170	50.0		µg/Kg	1	9/7/00
Acenaphthylene	4,100	50.0		µg/Kg	1	9/7/00
Anthracene	3,170	50.0		µg/Kg	1	9/7/00
Benz(a)anthracene	5,050	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	6,850	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	4,580	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	6,100	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	3,550	50.0		µg/Kg	1	9/7/00
Chrysene	6,250	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	1,080	50.0		µg/Kg	1	9/7/00
Fluoranthene	14,500	50.0		µg/Kg	1	9/7/00
Fluorene	2,920	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	4,920	50.0		µg/Kg	1	9/7/00
Naphthalene	1,210	50.0		µg/Kg	1	9/7/00
Phenanthrene	18,300	50.0		µg/Kg	1	9/7/00
Pyrene	17,200	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	103.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	105.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	116.0	23-120		%REC	1	9/7/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-53A

Client Sample ID: 2708-000828-053
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	56,700	140		µg/Kg-dry	50	9/6/00
Ethylbenzene	792	140		µg/Kg-dry	50	9/6/00
Toluene	9,210	140		µg/Kg-dry	50	9/6/00
Xylenes, Total	8,650	421		µg/Kg-dry	50	9/6/00
Surr: Trifluorotoluene	71.2	70-130		%REC	50	9/6/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	11.0	0		wt%	1	9/5/00

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-54B

Client Sample ID: 2708-000828-054
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.44	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	4.96	1.00		mg/Kg	1	9/6/00
Copper	10.1	1.00		mg/Kg	1	9/6/00
Lead	2.77	1.00		mg/Kg	1	9/6/00
Nickel	3.16	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	42.3	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	2,150	500		µg/Kg	10	9/9/00
Acenaphthylene	ND	500		µg/Kg	10	9/9/00
Anthracene	4,300	500		µg/Kg	10	9/9/00
Benz(a)anthracene	33,600	500		µg/Kg	10	9/9/00
Benzo(a)pyrene	47,000	500		µg/Kg	10	9/9/00
Benzo(b)fluoranthene	47,100	500		µg/Kg	10	9/9/00
Benzo(g,h,i)perylene	23,300	500		µg/Kg	10	9/9/00
Benzo(k)fluoranthene	36,600	500		µg/Kg	10	9/9/00
Chrysene	38,500	500		µg/Kg	10	9/9/00
Dibenz(a,h)anthracene	7,750	500		µg/Kg	10	9/9/00
Fluoranthene	52,500	500		µg/Kg	10	9/9/00
Fluorene	1,400	500		µg/Kg	10	9/9/00
Indeno(1,2,3-cd)pyrene	23,700	500		µg/Kg	10	9/9/00
Naphthalene	ND	500		µg/Kg	10	9/9/00
Phenanthrene	24,800	500		µg/Kg	10	9/9/00
Pyrene	45,500	500		µg/Kg	10	9/9/00
Surr: 2-Fluorobiphenyl	110.0	30-115		%REC	10	9/9/00
Surr: 4-Terphenyl-d14	120.0	18-137		%REC	10	9/9/00
Surr: Nitrobenzene-d5	100.0	23-120		%REC	10	9/9/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-55A

Client Sample ID: 2708-000828-055
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	3.33		µg/Kg-dry	1	9/6/00
Ethylbenzene	ND	3.33		µg/Kg-dry	1	9/6/00
Toluene	ND	3.33		µg/Kg-dry	1	9/6/00
Xylenes, Total	ND	10.0		µg/Kg-dry	1	9/6/00
Surr: Trifluorotoluene	98.2	70-130		%REC	1	9/6/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	25.0	0		wt%	1	9/6/00

Qualifiers:

ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits
J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank	E - Value above quantitation range
* - Value exceeds Maximum Contaminant Level	

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-55B

Client Sample ID: 2708-000828-055
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.11	1.00		mg/Kg	1	9/6/00
Arsenic	9.02	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	15.8	1.00		mg/Kg	1	9/6/00
Copper	21.3	1.00		mg/Kg	1	9/6/00
Lead	10.2	1.00		mg/Kg	1	9/6/00
Nickel	14.4	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	58.8	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	ND	50.0		µg/Kg	1	9/7/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/7/00
Anthracene	ND	50.0		µg/Kg	1	9/7/00
Benz(a)anthracene	ND	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	ND	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	60.0	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	9/7/00
Chrysene	ND	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	9/7/00
Fluoranthene	ND	50.0		µg/Kg	1	9/7/00
Fluorene	ND	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	9/7/00
Naphthalene	ND	50.0		µg/Kg	1	9/7/00
Phenanthrene	ND	50.0		µg/Kg	1	9/7/00
Pyrene	ND	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	96.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	94.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	111.0	23-120		%REC	1	9/7/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-56A

Client Sample ID: 2708-000828-056
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	3.33		µg/Kg-dry	1	9/6/00
Ethylbenzene	ND	3.33		µg/Kg-dry	1	9/6/00
Toluene	ND	3.33		µg/Kg-dry	1	9/6/00
Xylenes, Total	ND	10.0		µg/Kg-dry	1	9/6/00
Surr: Trifluorotoluene	98.0	70-130		%REC	1	9/6/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	25.0	0		wt%	1	9/6/00

Qualifiers:

ND - Not Detected at the Reporting Limit	S - Spike Recovery outside accepted recovery limits
J - Analyte detected below quantitation limits	R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank	E - Value above quantitation range
* - Value exceeds Maximum Contaminant Level	

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT:	Hahn & Associates	Client Sample ID:	2708-000828-056
Lab Order:	0008163	Tag Number:	
Project:	NW Natural/Gasco	Collection Date:	8/28/00
Lab ID:	0008163-56B	Matrix:	SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.02	1.00		mg/Kg	1	9/6/00
Arsenic	5.52	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	16.5	1.00		mg/Kg	1	9/6/00
Copper	70.7	1.00		mg/Kg	1	9/6/00
Lead	31.1	1.00		mg/Kg	1	9/6/00
Nickel	18.9	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	60.4	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	ND	50.0		µg/Kg	1	9/7/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/7/00
Anthracene	ND	50.0		µg/Kg	1	9/7/00
Benz(a)anthracene	ND	50.0		µg/Kg	1	9/7/00
Benzo(a)pyrene	ND	50.0		µg/Kg	1	9/7/00
Benzo(b)fluoranthene	85.0	50.0		µg/Kg	1	9/7/00
Benzo(g,h,i)perylene	ND	50.0		µg/Kg	1	9/7/00
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	9/7/00
Chrysene	ND	50.0		µg/Kg	1	9/7/00
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	9/7/00
Fluoranthene	75.0	50.0		µg/Kg	1	9/7/00
Fluorene	ND	50.0		µg/Kg	1	9/7/00
Indeno(1,2,3-cd)pyrene	ND	50.0		µg/Kg	1	9/7/00
Naphthalene	ND	50.0		µg/Kg	1	9/7/00
Phenanthrene	ND	50.0		µg/Kg	1	9/7/00
Pyrene	80.0	50.0		µg/Kg	1	9/7/00
Surr: 2-Fluorobiphenyl	103.0	30-115		%REC	1	9/7/00
Surr: 4-Terphenyl-d14	106.0	18-137		%REC	1	9/7/00
Surr: Nitrobenzene-d5	114.0	23-120		%REC	1	9/7/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-57A

Client Sample ID: 2708-000828-057
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.81		µg/Kg-dry	1	9/6/00
Ethylbenzene	ND	2.81		µg/Kg-dry	1	9/6/00
Toluene	ND	2.81		µg/Kg-dry	1	9/6/00
Xylenes, Total	ND	8.43		µg/Kg-dry	1	9/6/00
Surr: Trifluorotoluene	101.0	70-130		%REC	1	9/6/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	11.0	0		wt%	1	9/6/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-57B

Client Sample ID: 2708-000828-057
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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Analyses	Result	Limit	Qual	Units	DF	Date Analyzed	
PAH BY SIM, SOIL		8270-SIM				Analyst: keh	
Acenaphthene	ND	50.0		µg/Kg	1	9/7/00	
Acenaphthylene	210	50.0		µg/Kg	1	9/7/00	
Anthracene	ND	50.0		µg/Kg	1	9/7/00	
Benz(a)anthracene	355	50.0		µg/Kg	1	9/7/00	
Benzo(a)pyrene	1,050	50.0		µg/Kg	1	9/7/00	
Benzo(b)fluoranthene	980	50.0		µg/Kg	1	9/7/00	
Benzo(g,h,i)perylene	1,980	50.0		µg/Kg	1	9/7/00	
Benzo(k)fluoranthene	635	50.0		µg/Kg	1	9/7/00	
Chrysene	665	50.0		µg/Kg	1	9/7/00	
Dibenz(a,h)anthracene	230	50.0		µg/Kg	1	9/7/00	
Fluoranthene	360	50.0		µg/Kg	1	9/7/00	
Fluorene	ND	50.0		µg/Kg	1	9/7/00	
Indeno(1,2,3-cd)pyrene	1,400	50.0		µg/Kg	1	9/7/00	
Naphthalene	ND	50.0		µg/Kg	1	9/7/00	
Phenanthrene	ND	50.0		µg/Kg	1	9/7/00	
Pyrene	490	50.0		µg/Kg	1	9/7/00	
Surr: 2-Fluorobiphenyl	96.0	30-115		%REC	1	9/7/00	
Surr: 4-Terphenyl-d14	95.0	18-137		%REC	1	9/7/00	
Surr: Nitrobenzene-d5	92.0	23-120		%REC	1	9/7/00	

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-58B

Client Sample ID: 2708-000828-058
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.16	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	11.1	1.00		mg/Kg	1	9/6/00
Copper	11.5	1.00		mg/Kg	1	9/6/00
Lead	8.20	1.00		mg/Kg	1	9/6/00
Nickel	6.57	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	71.4	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	1,300	500		µg/Kg	10	9/9/00
Acenaphthylene	ND	500		µg/Kg	10	9/9/00
Anthracene	2,450	500		µg/Kg	10	9/9/00
Benzo(a)anthracene	19,500	500		µg/Kg	10	9/9/00
Benzo(a)pyrene	30,800	500		µg/Kg	10	9/9/00
Benzo(b)fluoranthene	29,700	500		µg/Kg	10	9/9/00
Benzo(g,h,i)perylene	15,100	500		µg/Kg	10	9/9/00
Benzo(k)fluoranthene	21,900	500		µg/Kg	10	9/9/00
Chrysene	22,800	500		µg/Kg	10	9/9/00
Dibenz(a,h)anthracene	4,950	500		µg/Kg	10	9/9/00
Fluoranthene	29,600	500		µg/Kg	10	9/9/00
Fluorene	750	500		µg/Kg	10	9/9/00
Indeno(1,2,3-cd)pyrene	14,600	500		µg/Kg	10	9/9/00
Naphthalene	ND	500		µg/Kg	10	9/9/00
Phenanthrene	14,300	500		µg/Kg	10	9/9/00
Pyrene	32,400	500		µg/Kg	10	9/9/00
Surr: 2-Fluorobiphenyl	100.0	30-115		%REC	10	9/9/00
Surr: 4-Terphenyl-d14	110.0	18-137		%REC	10	9/9/00
Surr: Nitrobenzene-d5	90.0	23-120		%REC	10	9/9/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-59A

Client Sample ID: 2708-000828-059
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	2.72		µg/Kg-dry	1	9/6/00
Ethylbenzene	ND	2.72		µg/Kg-dry	1	9/6/00
Toluene	ND	2.72		µg/Kg-dry	1	9/6/00
Xylenes, Total	ND	8.15		µg/Kg-dry	1	9/6/00
Surr: Trifluorotoluene	105.0	70-130		%REC	1	9/6/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	8.00	0		wt%	1	9/6/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-59B

Client Sample ID: 2708-000828-059
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				
Mercury	ND	0.100		mg/Kg	1	9/6/00
						Analyst: cms
ICP METALS		EPA 6010B				
Antimony	ND	1.00		mg/Kg	1	9/6/00
Arsenic	2.75	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	12.5	1.00		mg/Kg	1	9/6/00
Copper	11.5	1.00		mg/Kg	1	9/6/00
Lead	1.65	1.00		mg/Kg	1	9/6/00
Nickel	13.3	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	35.7	1.00		mg/Kg	1	9/6/00
						Analyst: lmc
PAH BY SIM, SOIL		8270-SIM				
Acenaphthene	ND	50.0		µg/Kg	1	9/8/00
Acenaphthylene	75.0	50.0		µg/Kg	1	9/8/00
Anthracene	ND	50.0		µg/Kg	1	9/8/00
Benz(a)anthracene	135	50.0		µg/Kg	1	9/8/00
Benzo(a)pyrene	480	50.0		µg/Kg	1	9/8/00
Benzo(b)fluoranthene	385	50.0		µg/Kg	1	9/8/00
Benzo(g,h,i)perylene	625	50.0		µg/Kg	1	9/8/00
Benzo(k)fluoranthene	290	50.0		µg/Kg	1	9/8/00
Chrysene	190	50.0		µg/Kg	1	9/8/00
Dibenz(a,h)anthracene	150	50.0		µg/Kg	1	9/8/00
Fluoranthene	95.0	50.0		µg/Kg	1	9/8/00
Fluorene	ND	50.0		µg/Kg	1	9/8/00
Indeno(1,2,3-cd)pyrene	435	50.0		µg/Kg	1	9/8/00
Naphthalene	ND	50.0		µg/Kg	1	9/8/00
Phenanthrene	135	50.0		µg/Kg	1	9/8/00
Pyrene	140	50.0		µg/Kg	1	9/8/00
Surr: 2-Fluorobiphenyl	102.0	30-115		%REC	1	9/8/00
Surr: 4-Terphenyl-d14	91.0	18-137		%REC	1	9/8/00
Surr: Nitrobenzene-d5	112.0	23-120		%REC	1	9/8/00
						Analyst: keh

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-60A

Client Sample ID: 2708-000828-060
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
GAS/BTEX, SOIL		8015/8021				Analyst: sec
Benzene	ND	3.12		µg/Kg-dry	1	9/6/00
Ethylbenzene	ND	3.12		µg/Kg-dry	1	9/6/00
Toluene	ND	3.12		µg/Kg-dry	1	9/6/00
Xylenes, Total	ND	9.38		µg/Kg-dry	1	9/6/00
Surr: Trifluorotoluene	97.8	70-130		%REC	1	9/6/00
PERCENT MOISTURE		SM 2540				Analyst: sec
% Moisture	20.0	0		wt%	1	9/6/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-60B

Client Sample ID: 2708-000828-060
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	ND	1.00		mg/Kg	1	9/6/00
Arsenic	1.46	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	9.21	1.00		mg/Kg	1	9/6/00
Copper	10.1	1.00		mg/Kg	1	9/6/00
Lead	1.36	1.00		mg/Kg	1	9/6/00
Nickel	12.3	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	1.00		mg/Kg	1	9/6/00
Zinc	28.5	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	ND	50.0		µg/Kg	1	9/8/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/8/00
Anthracene	ND	50.0		µg/Kg	1	9/8/00
Benz(a)anthracene	ND	50.0		µg/Kg	1	9/8/00
Benzo(a)pyrene	ND	50.0		µg/Kg	1	9/8/00
Benzo(b)fluoranthene	90.0	50.0		µg/Kg	1	9/8/00
Benzo(g,h,i)perylene	85.0	50.0		µg/Kg	1	9/8/00
Benzo(k)fluoranthene	ND	50.0		µg/Kg	1	9/8/00
Chrysene	ND	50.0		µg/Kg	1	9/8/00
Dibenz(a,h)anthracene	ND	50.0		µg/Kg	1	9/8/00
Fluoranthene	ND	50.0		µg/Kg	1	9/8/00
Fluorene	ND	50.0		µg/Kg	1	9/8/00
Indeno(1,2,3-cd)pyrene	50	50.0		µg/Kg	1	9/8/00
Naphthalene	ND	50.0		µg/Kg	1	9/8/00
Phenanthrene	135	50.0		µg/Kg	1	9/8/00
Pyrene	ND	50.0		µg/Kg	1	9/8/00
Surr: 2-Fluorobiphenyl	91.0	30-115		%REC	1	9/8/00
Surr: 4-Terphenyl-d14	84.0	18-137		%REC	1	9/8/00
Surr: Nitrobenzene-d5	87.0	23-120		%REC	1	9/8/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-61B

Client Sample ID: 2708-000828-061
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	ND	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	5.55	1.00		mg/Kg	1	9/6/00
Copper	21.7	1.00		mg/Kg	1	9/6/00
Lead	3.74	1.00		mg/Kg	1	9/6/00
Nickel	4.89	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	45.9	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	ND	50.0		µg/Kg	1	9/8/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/8/00
Anthracene	ND	50.0		µg/Kg	1	9/8/00
Benz(a)anthracene	255	50.0		µg/Kg	1	9/8/00
Benzo(a)pyrene	350	50.0		µg/Kg	1	9/8/00
Benzo(b)fluoranthene	350	50.0		µg/Kg	1	9/8/00
Benzo(g,h,i)perylene	215	50.0		µg/Kg	1	9/8/00
Benzo(k)fluoranthene	290	50.0		µg/Kg	1	9/8/00
Chrysene	265	50.0		µg/Kg	1	9/8/00
Dibenz(a,h)anthracene	90.0	50.0		µg/Kg	1	9/8/00
Fluoranthene	375	50.0		µg/Kg	1	9/8/00
Fluorene	ND	50.0		µg/Kg	1	9/8/00
Indeno(1,2,3-cd)pyrene	195	50.0		µg/Kg	1	9/8/00
Naphthalene	ND	50.0		µg/Kg	1	9/8/00
Phenanthrene	215	50.0		µg/Kg	1	9/8/00
Pyrene	325	50.0		µg/Kg	1	9/8/00
Surr: 2-Fluorobiphenyl	91.0	30-115		%REC	1	9/8/00
Surr: 4-Terphenyl-d14	78.0	18-137		%REC	1	9/8/00
Surr: Nitrobenzene-d5	88.0	23-120		%REC	1	9/8/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
 Lab Order: 0008163
 Project: NW Natural/Gasco
 Lab ID: 0008163-62B

Client Sample ID: 2708-000828-062
 Tag Number:
 Collection Date: 8/28/00
 Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				
Antimony	ND	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	1.07	1.00		mg/Kg	1	9/6/00
Copper	6.24	1.00		mg/Kg	1	9/6/00
Lead	1.23	1.00		mg/Kg	1	9/6/00
Nickel	ND	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	32.7	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				
Acenaphthene	ND	50.0		µg/Kg	1	9/8/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/8/00
Anthracene	ND	50.0		µg/Kg	1	9/8/00
Benz(a)anthracene	205	50.0		µg/Kg	1	9/8/00
Benzo(a)pyrene	275	50.0		µg/Kg	1	9/8/00
Benzo(b)fluoranthene	275	50.0		µg/Kg	1	9/8/00
Benzo(g,h,i)perylene	195	50.0		µg/Kg	1	9/8/00
Benzo(k)fluoranthene	220	50.0		µg/Kg	1	9/8/00
Chrysene	235	50.0		µg/Kg	1	9/8/00
Dibenz(a,h)anthracene	85.0	50.0		µg/Kg	1	9/8/00
Fluoranthene	1,040	50.0		µg/Kg	1	9/8/00
Fluorene	ND	50.0		µg/Kg	1	9/8/00
Indeno(1,2,3-cd)pyrene	165	50.0		µg/Kg	1	9/8/00
Naphthalene	ND	50.0		µg/Kg	1	9/8/00
Phenanthrene	750	50.0		µg/Kg	1	9/8/00
Pyrene	275	50.0		µg/Kg	1	9/8/00
Surr: 2-Fluorobiphenyl	97.0	30-115		%REC	1	9/8/00
Surr: 4-Terphenyl-d14	85.0	18-137		%REC	1	9/8/00
Surr: Nitrobenzene-d5	95.0	23-120		%REC	1	9/8/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-63B

Client Sample ID: 2708-000828-063
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	1.34	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	3.21	1.00		mg/Kg	1	9/6/00
Copper	5.41	1.00		mg/Kg	1	9/6/00
Lead	4.17	1.00		mg/Kg	1	9/6/00
Nickel	2.08	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	55.1	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	125	50.0		µg/Kg	1	9/8/00
Acenaphthylene	ND	50.0		µg/Kg	1	9/8/00
Anthracene	ND	50.0		µg/Kg	1	9/8/00
Benz(a)anthracene	1,340	50.0		µg/Kg	1	9/8/00
Benzo(a)pyrene	2,010	50.0		µg/Kg	1	9/8/00
Benzo(b)fluoranthene	1,740	50.0		µg/Kg	1	9/8/00
Benzo(g,h,i)perylene	1,340	50.0		µg/Kg	1	9/8/00
Benzo(k)fluoranthene	1,520	50.0		µg/Kg	1	9/8/00
Chrysene	1,600	50.0		µg/Kg	1	9/8/00
Dibenz(a,h)anthracene	385	50.0		µg/Kg	1	9/8/00
Fluoranthene	2,220	50.0		µg/Kg	1	9/8/00
Fluorene	50	50.0		µg/Kg	1	9/8/00
Indeno(1,2,3-cd)pyrene	1,200	50.0		µg/Kg	1	9/8/00
Naphthalene	ND	50.0		µg/Kg	1	9/8/00
Phenanthrene	930	50.0		µg/Kg	1	9/8/00
Pyrene	2,040	50.0		µg/Kg	1	9/8/00
Surr: 2-Fluorobiphenyl	95.0	30-115		%REC	1	9/8/00
Surr: 4-Terphenyl-d14	84.0	18-137		%REC	1	9/8/00
Surr: Nitrobenzene-d5	80.0	23-120		%REC	1	9/8/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-64B

Client Sample ID: 2708-000828-064
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	0.578	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: Imc
Antimony	1.13	1.00		mg/Kg	1	9/6/00
Arsenic	3.34	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	4.94	1.00		mg/Kg	1	9/6/00
Copper	11.0	1.00		mg/Kg	1	9/6/00
Lead	132	1.00		mg/Kg	1	9/6/00
Nickel	5.78	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	58.5	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	2,350	500		µg/Kg	10	9/9/00
Acenaphthylene	2,500	500		µg/Kg	10	9/9/00
Anthracene	37,200	500		µg/Kg	10	9/9/00
Benz(a)anthracene	40,700	500		µg/Kg	10	9/9/00
Benzo(a)pyrene	23,100	500		µg/Kg	10	9/9/00
Benzo(b)fluoranthene	34,400	500		µg/Kg	10	9/9/00
Benzo(g,h,i)perylene	12,000	500		µg/Kg	10	9/9/00
Benzo(k)fluoranthene	25,600	500		µg/Kg	10	9/9/00
Chrysene	58,500	500		µg/Kg	10	9/9/00
Dibenz(a,h)anthracene	3,450	500		µg/Kg	10	9/9/00
Fluoranthene	198,000	500		µg/Kg	10	9/9/00
Fluorene	3,200	500		µg/Kg	10	9/9/00
Indeno(1,2,3-cd)pyrene	11,500	500		µg/Kg	10	9/9/00
Naphthalene	ND	500		µg/Kg	10	9/9/00
Phenanthrene	57,500	500		µg/Kg	10	9/9/00
Pyrene	152,000	500		µg/Kg	10	9/9/00
Surr: 2-Fluorobiphenyl	110.0	30-115		%REC	10	9/9/00
Surr: 4-Terphenyl-d14	130.0	18-137		%REC	10	9/9/00
Surr: Nitrobenzene-d5	100.0	23-120		%REC	10	9/9/00

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 B - Analyte detected in the associated Method Blank
 * - Value exceeds Maximum Contaminant Level
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 E - Value above quantitation range

Environmental Services Laboratory

Date: 22-Sep-00

CLIENT: Hahn & Associates
Lab Order: 0008163
Project: NW Natural/Gasco
Lab ID: 0008163-65B

Client Sample ID: 2708-000828-065
Tag Number:
Collection Date: 8/28/00
Matrix: SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
MERCURY		EPA 7471A				Analyst: cms
Mercury	ND	0.100		mg/Kg	1	9/6/00
ICP METALS		EPA 6010B				Analyst: lmc
Antimony	ND	1.00		mg/Kg	1	9/6/00
Arsenic	ND	1.00		mg/Kg	1	9/6/00
Beryllium	ND	1.00		mg/Kg	1	9/6/00
Cadmium	ND	1.00		mg/Kg	1	9/6/00
Chromium	5.47	1.00		mg/Kg	1	9/6/00
Copper	6.73	1.00		mg/Kg	1	9/6/00
Lead	4.33	1.00		mg/Kg	1	9/6/00
Nickel	3.02	1.00		mg/Kg	1	9/6/00
Selenium	ND	1.00		mg/Kg	1	9/6/00
Silver	ND	1.00		mg/Kg	1	9/6/00
Thallium	ND	10.0		mg/Kg	1	9/6/00
Zinc	37.9	1.00		mg/Kg	1	9/6/00
PAH BY SIM, SOIL		8270-SIM				Analyst: keh
Acenaphthene	3,100	500		µg/Kg	10	9/9/00
Acenaphthylene	ND	500		µg/Kg	10	9/9/00
Anthracene	5,550	500		µg/Kg	10	9/9/00
Benz(a)anthracene	42,600	500		µg/Kg	10	9/9/00
Benzo(a)pyrene	68,500	500		µg/Kg	10	9/9/00
Benzo(b)fluoranthene	60,500	500		µg/Kg	10	9/9/00
Benzo(g,h,i)perylene	33,800	500		µg/Kg	10	9/9/00
Benzo(k)fluoranthene	47,400	500		µg/Kg	10	9/9/00
Chrysene	49,400	500		µg/Kg	10	9/9/00
Dibenz(a,h)anthracene	11,400	500		µg/Kg	10	9/9/00
Fluoranthene	71,500	500		µg/Kg	10	9/9/00
Fluorene	1,750	500		µg/Kg	10	9/9/00
Indeno(1,2,3-cd)pyrene	34,700	500		µg/Kg	10	9/9/00
Naphthalene	ND	500		µg/Kg	10	9/9/00
Phenanthrene	32,400	500		µg/Kg	10	9/9/00
Pyrene	65,000	500		µg/Kg	10	9/9/00
Surr: 2-Fluorobiphenyl	100.0	30-115		%REC	10	9/9/00
Surr: 4-Terphenyl-d14	110.0	18-137		%REC	10	9/9/00
Surr: Nitrobenzene-d5	100.0	23-120		%REC	10	9/9/00

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank E - Value above quantitation range
 * - Value exceeds Maximum Contaminant Level

Environmental Services Laboratory

Date: 12-Sep-00

CLIENT: Hahn & Associates

Work Order: 0008163

Project: NW Natural/Gasco

QC SUMMARY REPORT

Method Blank

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1-Methylnaphthalene	ND	50									
2-Methylnaphthalene	ND	50									
Acenaphthene	ND	50									
Acenaphthylene	ND	50									
Anthracene	ND	50									
Benz(a)anthracene	ND	50									
Benzo(a)pyrene	ND	50									
Benzo(b)fluoranthene	ND	50									
Benzo(g,h,i)perylene	ND	50									
Benzo(k)fluoranthene	ND	50									
Chrysene	ND	50									
Dibenz(a,h)anthracene	ND	50									
Fluoranthene	ND	50									
Fluorene	ND	50									
Indeno(1,2,3-cd)pyrene	ND	50									
Naphthalene	ND	50									
Phenanthrene	ND	50									
Pyrene	ND	50									

Sample ID: MB-1818 Batch ID: 1818 Test Code: 8270-SIM Units: µg/Kg Analysis Date 9/1/00 Prep Date: 8/30/00

Client ID: 0008163 Run ID: HEISENBURG_000901A SeqNo: 51028

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

QC SUMMARY REPORT

Method Blank

Sample ID: MB-1821 **Batch ID:** 1821 **Test Code:** 8270-SIM **Units:** µg/Kg **Analysis Date:** 9/5/00 **Prep Date:** 8/31/00
Client ID: 0008163 **Run ID:** HEISENBURG_000905A **SeqNo:** 51149

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50									
Acenaphthylene	ND	50									
Anthracene	ND	50									
Benz(a)anthracene	ND	50									
Benzo(a)pyrene	ND	50									
Benzo(b)fluoranthene	ND	50									
Benzo(g,h,i)perylene	ND	50									
Benzo(k)fluoranthene	ND	50									
Chrysene	ND	50									
Dibenz(a,h)anthracene	ND	50									
Fluoranthene	ND	50									
Fluorene	ND	50									
Indeno(1,2,3-cd)pyrene	ND	50									
Naphthalene	ND	50									
Phenanthrene	ND	50									
Pyrene	ND	50									

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

QC SUMMARY REPORT

Method Blank

CLIENT: Hahn & Associates

Work Order: 0008163

Project: NW Natural/Gasco

Sample ID: MB-1822 Batch ID: 1822 Test Code: EPA 6010B Units: mg/Kg Analysis Date 9/6/00 Prep Date: 9/1/00

Client ID: 0008163 Run ID: ICP_000906A SeqNo: 51266

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	1									
Arsenic	ND	1									
Beryllium	ND	1									
Cadmium	ND	1									
Chromium	ND	1									
Copper	ND	1									
Lead	ND	1									
Nickel	ND	1									
Selenium	ND	1									
Silver	ND	1									
Thallium	ND	1									

Sample ID: MB-1823 Batch ID: 1823 Test Code: EPA 6010B Units: mg/Kg Analysis Date 9/6/00 Prep Date: 9/1/00

Client ID: 0008163 Run ID: ICP_000906B SeqNo: 51617

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	1									
Arsenic	ND	1									
Beryllium	ND	1									
Cadmium	ND	1									
Chromium	ND	1									
Copper	ND	1									
Lead	ND	1									
Nickel	ND	1									
Selenium	ND	1									
Silver	ND	1									
Thallium	ND	1									

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

QC SUMMARY REPORT
Method Blank

Sample ID: MB-1827 Batch ID: 1827 Test Code: 8270-SIM Units: µg/Kg Analysis Date 9/15/00 Prep Date: 9/1/00
 Client ID: 0008163 Run ID: HEISENBURG_000905A SeqNo: 51152

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50									
Acenaphthylene	ND	50									
Anthracene	ND	50									
Benz(a)anthracene	ND	50									
Benzo(a)pyrene	ND	50									
Benzo(b)fluoranthene	ND	50									
Benzo(g,h,i)perylene	ND	50									
Benzo(k)fluoranthene	ND	50									
Chrysene	ND	50									
Dibenz(a,h)anthracene	ND	50									
Fluoranthene	ND	50									
Fluorene	ND	50									
Indeno(1,2,3-cd)pyrene	ND	50									
Naphthalene	ND	50									
Phenanthrene	ND	50									
Pyrene	ND	50									

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

QC SUMMARY REPORT

Method Blank

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

Sample ID: MB-1830	Batch ID: 1830	Test Code: EPA 6010B	Units: mg/Kg	Analysis Date 9/6/00	Prep Date: 9/1/00						
Client ID:	0008163	Run ID: ICP_000906B		SeqNo: 51642							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	1									
Arsenic	ND	1									
Beryllium	ND	1									
Cadmium	ND	1									
Chromium	ND	1									
Copper	ND	1									
Lead	ND	1									
Nickel	ND	1									
Selenium	ND	1									
Silver	ND	1									
Thallium	ND	1									

Sample ID: MB-1833	Batch ID: 1833	Test Code: EPA 7471A	Units: mg/Kg	Analysis Date 9/6/00	Prep Date: 9/5/00						
Client ID:	0008163	Run ID: MERC_000906B		SeqNo: 51310							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.1									

Sample ID: MB-1834	Batch ID: 1834	Test Code: EPA 7471A	Units: mg/Kg	Analysis Date 9/6/00	Prep Date: 9/5/00						
Client ID:	0008163	Run ID: MERC_000906C		SeqNo: 51351							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.1									

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

CLIENT: Hahn & Associates
 Work Order: 0008163
 Project: NW Natural/Gasco

QC SUMMARY REPORT
 Method Blank

Sample ID: MB-1835 Batch ID: 1835 Test Code: 8270-SIM Units: µg/Kg Analysis Date 9/8/00 Prep Date: 9/5/00

Client ID: 0008163 Run ID: HEISENBURG_000908A SeqNo: 51713

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	50									
Acenaphthylene	ND	50									
Anthracene	ND	50									
Benz(a)anthracene	ND	50									
Benzo(a)pyrene	ND	50									
Benzo(b)fluoranthene	ND	50									
Benzo(g,h,i)perylene	ND	50									
Benzo(k)fluoranthene	ND	50									
Chrysene	ND	50									
Dibenz(a,h)anthracene	ND	50									
Fluoranthene	ND	50									
Fluorene	ND	50									
Indeno(1,2,3-cd)pyrene	ND	50									
Naphthalene	ND	50									
Phenanthrene	ND	50									
Pyrene	ND	50									

Sample ID: MB-1837 Batch ID: 1837 Test Code: EPA 7471A Units: mg/Kg Analysis Date 9/6/00 Prep Date: 9/5/00

Client ID: 0008163 Run ID: MERC_000906A SeqNo: 51292

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.1									

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: 12-Sep-00

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

QC SUMMARY REPORT

Sample Duplicate

Sample ID:	0008163-01B DUP	Batch ID:	1822	Test Code:	EPA 6010B	Units:	mg/Kg	Analysis Date	9/6/00	Prep Date:	9/1/00
Client ID:	2708-000828-001	Run ID:	0008163	SeqNo:	ICP_000906A	SPK value	SPK Ref Val	LowLimit	HighLimit	RPD Ref Val	%RPD
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	1.91	1	0	0	0.0%	0	0	1.73	9.9%	20	
Arsenic	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Beryllium	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Cadmium	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Chromium	9.29	1	0	0	0.0%	0	0	0	0.0%	20	
Copper	11.5	1	0	0	0.0%	0	0	5.43	52.4%	20	R
Lead	7.6	1	0	0	0.0%	0	0	10.2	12.0%	20	
Nickel	4.87	1	0	0	0.0%	0	0	7.69	1.2%	20	
Selenium	ND	1	0	0	0.0%	0	0	3.98	20.1%	20	R
Silver	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Thallium	ND	1	0	0	0.0%	0	0	0	0.0%	20	

Sample ID:	0008163-31B DUP	Batch ID:	1823	Test Code:	EPA 6010B	Units:	mg/Kg	Analysis Date	9/6/00	Prep Date:	9/1/00
Client ID:	2708-000828-031	Run ID:	0008163	SeqNo:	ICP_000906B	SPK value	SPK Ref Val	LowLimit	HighLimit	RPD Ref Val	%RPD
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	1.28	1	0	0	0.0%	0	0	1.03	21.6%	20	R, T
Arsenic	1.05	1	0	0	0.0%	0	0	0	200.0%	20	R, T
Beryllium	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Cadmium	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Chromium	10.2	1	0	0	0.0%	0	0	0	0.0%	20	
Copper	10.3	1	0	0	0.0%	0	0	8.86	14.1%	20	
Lead	17.1	1	0	0	0.0%	0	0	9.23	11.0%	20	
Nickel	13.1	1	0	0	0.0%	0	0	18.3	6.8%	20	
Selenium	ND	1	0	0	0.0%	0	0	11.1	16.5%	20	
Silver	ND	1	0	0	0.0%	0	0	0	0.0%	20	
Thallium	ND	10	0	0	0.0%	0	0	0	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: 12-Sep-00

CLIENT: Hahn & Associates

Work Order: 0008163

Project: NW Natural/Gasco

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: 0008163-02A MS	Batch ID: 04 BG S-9/1/0	Test Code: 8015/8021	Units: µg/Kg-dry	Analysis Date 8/31/00	Prep Date:						
Client ID: 2708-000828-002	Run ID: WATSON_000831A	SeqNo: 50987									
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	202.7	2.66	212.8	0	95.3%	85	115	0			
Ethylbenzene	215.4	2.66	212.8	0	101.3%	85	115	0			
Toluene	212.2	2.66	212.8	0	99.8%	85	115	0			
Xylenes, Total	659.6	7.98	638.3	0	103.3%	85	115	0			

Sample ID: 0008163-02A MSD	Batch ID: 04 BG S-9/1/0	Test Code: 8015/8021	Units: µg/Kg-dry	Analysis Date 8/31/00	Prep Date:						
Client ID: 2708-000828-002	Run ID: WATSON_000831A	SeqNo: 50988									
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	204.3	2.66	212.8	0	96.0%	85	115	202.7	0.8%	20	
Ethylbenzene	215.4	2.66	212.8	0	101.3%	85	115	215.4	0.0%	20	
Toluene	212.8	2.66	212.8	0	100.0%	85	115	212.2	0.3%	20	
Xylenes, Total	659.6	7.98	638.3	0	103.3%	85	115	659.6	0.0%	20	

Sample ID: 0008163-08A MS	Batch ID: 04 BG S-9/4/0	Test Code: 8015/8021	Units: µg/Kg-dry	Analysis Date 9/1/00	Prep Date:						
Client ID: 2708-000828-008	Run ID: CRICK_000831A	SeqNo: 50994									
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	213.3	2.78	222.2	0	96.0%	85	115	0			
Ethylbenzene	212.8	2.78	222.2	0	95.7%	85	115	0			
Toluene	216.7	2.78	222.2	0	97.5%	85	115	0			
Xylenes, Total	644.4	8.33	666.7	0	96.7%	85	115	0			

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

Sample ID: 0008163-08A MSD Batch ID: 04 BG S-9/4/0 Test Code: 8015/8021 Units: µg/Kg-dry Analysis Date 8/31/00 Prep Date:
 Client ID: 2708-000828-008 0008163 Run ID: CRICK_000831A SeqNo: 50995

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	213.3	2.78	222.2	0	96.0%	85	115	213.3	0.0%	20	
Ethylbenzene	195	2.78	222.2	0	87.7%	85	115	212.8	8.7%	20	
Toluene	213.3	2.78	222.2	0	96.0%	85	115	216.7	1.6%	20	
Xylenes, Total	588.9	8.33	666.7	0	88.3%	85	115	644.4	9.0%	20	

Sample ID: 0008157-07A MS Batch ID: 1818 Test Code: 8270-SIM Units: µg/Kg Analysis Date 9/1/00 Prep Date: 8/30/00
 Client ID: 0008163 Run ID: HEISENBURG_000901A SeqNo: 51038

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1-Methylnaphthalene	510	50	500	0	102.0%	21	133	0			
2-Methylnaphthalene	495	50	500	0	99.0%	21	133	0			
Acenaphthene	450	50	500	0	90.0%	47	145	0			
Acenaphthylene	435	50	500	0	87.0%	33	145	0			
Anthracene	535	50	500	0	107.0%	27	133	0			
Benz(a)anthracene	420	50	500	0	84.0%	33	143	0			
Benzo(a)pyrene	400	50	500	0	80.0%	17	163	0			
Benzo(b)fluoranthene	390	50	500	0	78.0%	24	159	0			
Benzo(g,h,i)perylene	445	50	500	0	89.0%	1	219	0			
Benzo(k)fluoranthene	525	50	500	0	105.0%	11	162	0			
Chrysene	450	50	500	0	90.0%	17	168	0			
Dibenz(a,h)anthracene	305	50	500	0	61.0%	1	227	0			
Fluoranthene	445	50	500	0	89.0%	26	137	0			
Fluorene	335	50	500	0	67.0%	59	121	0			
Indeno(1,2,3-cd)pyrene	390	50	500	0	78.0%	1	171	0			
Naphthalene	460	50	500	0	92.0%	21	133	0			
Phenanthrene	425	50	500	0	85.0%	54	120	0			
Pyrene	525	50	500	0	105.0%	52	115	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

CLIENT: Hahn & Associates

Work Order: 0008163

Project: NW Natural/Gasco

Sample ID: 0008157-07A MSD Batch ID: 1818 Test Code: 8270-SIM Units: µg/Kg Analysis Date 9/1/00 Prep Date: 8/30/00

Client ID: 0008163 Run ID: HEISENBURG_000901A SeqNo: 51039

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1-Methylnaphthalene	425	50	500	0	85.0%	21	133	510	18.2%	30	
2-Methylnaphthalene	410	50	500	0	82.0%	21	133	495	18.8%	30	
Acenaphthene	410	50	500	0	82.0%	47	145	450	9.3%	30	
Acenaphthylene	390	50	500	0	78.0%	33	145	435	10.9%	30	
Anthracene	465	50	500	0	93.0%	27	133	535	14.0%	30	
Benz(a)anthracene	345	50	500	0	69.0%	33	143	420	19.6%	30	
Benzo(a)pyrene	370	50	500	0	74.0%	17	163	400	7.8%	30	
Benzo(b)fluoranthene	330	50	500	0	66.0%	24	159	390	16.7%	30	
Benzo(g,h,i)perylene	405	50	500	0	81.0%	1	219	445	9.4%	30	
Benzo(k)fluoranthene	500	50	500	0	100.0%	11	162	525	4.9%	30	
Chrysene	425	50	500	0	85.0%	17	168	450	5.7%	30	
Dibenz(a,h)anthracene	315	50	500	0	63.0%	1	227	305	3.2%	30	
Fluoranthene	395	50	500	0	79.0%	26	137	445	11.9%	30	
Fluorene	350	50	500	0	70.0%	59	121	335	4.4%	30	
Indeno(1,2,3-cd)pyrene	370	50	500	0	74.0%	1	171	390	5.3%	30	
Naphthalene	405	50	500	0	81.0%	21	133	460	12.7%	30	
Phenanthrene	385	50	500	0	77.0%	54	120	425	9.9%	30	
Pyrene	465	50	500	0	93.0%	52	115	525	12.1%	30	

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

QC SUMMARY REPORT

Sample Matrix Spike

CLIENT: Hahn & Associates
 Work Order: 0008163
 Project: NW Natural/Gasco

Prep Date: 8/31/00

Analysis Date 9/5/00

SeqNo: 51159

Test Code: 8270-SIM Units: µg/Kg

Run ID: HEISENBURG_000905A

Batch ID: 1821

0008163

Sample ID: 0008163-11B MS
 Client ID: 2708-000828-011

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	490	50	500	0	98.0%	47	145	0			
Acenaphthylene	495	50	500	0	99.0%	33	145	0			
Anthracene	590	50	500	0	118.0%	27	133	0			
Benzo(a)anthracene	515	50	500	0	103.0%	33	143	0			
Benzo(a)pyrene	450	50	500	0	90.0%	17	163	0			
Benzo(b)fluoranthene	420	50	500	0	84.0%	24	159	0			
Benzo(g,h,i)perylene	480	50	500	0	96.0%	1	219	0			
Benzo(k)fluoranthene	575	50	500	0	115.0%	11	162	0			
Chrysene	505	50	500	0	101.0%	17	168	0			
Dibenz(a,h)anthracene	445	50	500	0	89.0%	1	227	0			
Fluoranthene	510	50	500	0	102.0%	26	137	0			
Fluorene	530	50	500	0	106.0%	59	121	0			
Indeno(1,2,3-cd)pyrene	480	50	500	0	96.0%	1	171	0			
Naphthalene	495	50	500	0	99.0%	21	133	0			
Phenanthrene	470	50	500	0	94.0%	54	120	0			
Pyrene	515	50	500	0	103.0%	52	115	0			

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

CLIENT: Hahn & Associates

Work Order: 0008163

Project: NW Natural/Gasco

Sample ID: 0008163-11B MSD Batch ID: 1821 Test Code: 8270-SIM Units: µg/Kg Analysis Date 9/5/00 Prep Date: 8/31/00

Client ID: 2708-000828-011 0008163 Run ID: HEISENBURG_000905A SeqNo: 51160

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	490	50	500	0	98.0%	47	145	490	0.0%	30	
Acenaphthylene	475	50	500	0	95.0%	33	145	495	4.1%	30	
Anthracene	595	50	500	0	119.0%	27	133	590	0.8%	30	
Benz(a)anthracene	505	50	500	0	101.0%	33	143	515	2.0%	30	
Benzo(a)pyrene	440	50	500	0	88.0%	17	163	450	2.2%	30	
Benzo(b)fluoranthene	405	50	500	0	81.0%	24	159	420	3.6%	30	
Benzo(g,h,i)perylene	470	50	500	0	94.0%	1	219	480	2.1%	30	
Benzo(k)fluoranthene	620	50	500	0	124.0%	11	162	575	7.5%	30	
Chrysene	525	50	500	0	105.0%	17	168	505	3.9%	30	
Dibenz(a,h)anthracene	365	50	500	0	73.0%	1	227	445	19.8%	30	
Fluoranthene	475	50	500	0	95.0%	26	137	510	7.1%	30	
Fluorene	505	50	500	0	101.0%	59	121	530	4.8%	30	
Indeno(1,2,3-cd)pyrene	440	50	500	0	88.0%	1	171	480	8.7%	30	
Naphthalene	495	50	500	0	99.0%	21	133	495	0.0%	30	
Phenanthrene	440	50	500	0	88.0%	54	120	470	6.6%	30	
Pyrene	585	50	500	0	117.0%	52	115	515	12.7%	30	S

Qualifiers: ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

QC SUMMARY REPORT

Sample Matrix Spike

CLIENT: Hahn & Associates
 Work Order: 0008163
 Project: NW Natural/Gasco

Prep Date: 9/1/00

Sample ID: 0008163-01B MS Batch ID: 1822 Test Code: EPA 6010B Units: mg/Kg
 Client ID: 2708-000828-001 0008163 Run ID: ICP_000906A Analysis Date 9/6/00 SeqNo: 51270

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	26.8	1	50	1.73	50.1%	75	125	0			S
Arsenic	40.2	1	50	0	80.4%	75	125	0			
Beryllium	40.4	1	50	0	80.8%	75	125	0			
Cadmium	38.6	1	50	0	77.2%	75	125	0			
Chromium	49.9	1	50	5.43	88.9%	75	125	0			
Copper	57.2	1	50	10.2	94.0%	75	125	0			
Lead	48.2	1	50	7.69	81.0%	75	125	0			
Nickel	46.6	1	50	3.98	85.2%	75	125	0			
Selenium	37.3	1	50	0	74.6%	75	125	0			S
Silver	43.1	1	50	0	86.2%	75	125	0			
Thallium	37.1	1	50	0	74.2%	75	125	0			S

Prep Date: 9/1/00

Sample ID: 0008163-01B MSD Batch ID: 1822 Test Code: EPA 6010B Units: mg/Kg
 Client ID: 2708-000828-001 0008163 Run ID: ICP_000906A Analysis Date 9/6/00 SeqNo: 51271

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	24.1	1	50	1.73	44.7%	75	125	26.8	10.6%	20	S
Arsenic	39.9	1	50	0	79.8%	75	125	40.2	0.7%	20	
Beryllium	40	1	50	0	80.0%	75	125	40.4	1.0%	20	
Cadmium	38	1	50	0	76.0%	75	125	38.6	1.6%	20	
Chromium	49.6	1	50	5.43	88.3%	75	125	49.9	0.6%	20	
Copper	58.3	1	50	10.2	96.2%	75	125	57.2	1.9%	20	
Lead	49.2	1	50	7.69	83.0%	75	125	48.2	2.1%	20	
Nickel	46.2	1	50	3.98	84.4%	75	125	46.6	0.9%	20	
Selenium	36.3	1	50	0	72.6%	75	125	37.3	2.7%	20	S
Silver	42.3	1	50	0	84.6%	75	125	43.1	1.9%	20	
Thallium	35.9	1	50	0	71.8%	75	125	37.1	3.3%	20	S

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

QC SUMMARY REPORT
Sample Matrix Spike

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

Sample ID: 0008163-31B MS **Batch ID:** 1823 **Test Code:** EPA 6010B **Units:** mg/Kg **Analysis Date:** 9/6/00 **Prep Date:** 9/1/00
Client ID: 2708-000828-031 **Run ID:** 0008163 **SeqNo:** 51621 **ICP_000906B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	22.2	1	50	1.03	42.3%	75	125	0			S
Arsenic	37.4	1	50	0	74.8%	75	125	0			S
Beryllium	40.7	1	50	0	81.4%	75	125	0			
Cadmium	37.7	1	50	0	75.4%	75	125	0			
Chromium	49.8	1	50	8.86	81.9%	75	125	0			
Copper	52.7	1	50	9.23	86.9%	75	125	0			
Lead	57	1	50	18.3	77.4%	75	125	0			
Nickel	49.8	1	50	11.1	77.4%	75	125	0			
Selenium	35.7	1	50	0	71.4%	75	125	0			S
Silver	41.7	1	50	0	83.4%	75	125	0			
Thallium	ND	10	50	0	0.0%	75	125	0			S

Sample ID: 0008163-31B MSD **Batch ID:** 1823 **Test Code:** EPA 6010B **Units:** mg/Kg **Analysis Date:** 9/6/00 **Prep Date:** 9/1/00
Client ID: 2708-000828-031 **Run ID:** 0008163 **SeqNo:** 51622 **ICP_000906B**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	17.2	1	50	1.03	32.3%	75	125	22.2	25.4%	20	S, R, Q
Arsenic	36.9	1	50	0	73.8%	75	125	37.4	1.3%	20	S
Beryllium	39.9	1	50	0	79.8%	75	125	40.7	2.0%	20	
Cadmium	36.9	1	50	0	73.8%	75	125	37.7	2.1%	20	S
Chromium	52.6	1	50	8.86	87.5%	75	125	49.8	5.5%	20	
Copper	52.2	1	50	9.23	85.9%	75	125	52.7	1.0%	20	
Lead	55.2	1	50	18.3	73.8%	75	125	57	3.2%	20	S
Nickel	51.8	1	50	11.1	81.4%	75	125	49.8	3.9%	20	
Selenium	36.2	1	50	0	72.4%	75	125	35.7	1.4%	20	S
Silver	40.7	1	50	0	81.4%	75	125	41.7	2.4%	20	
Thallium	ND	10	50	0	0.0%	75	125	0	0.0%	20	S

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID: 0008163-02B MS Batch ID: 1833 Test Code: EPA 7471A Units: mg/Kg Analysis Date 9/6/00 Prep Date: 9/5/00
 Client ID: 2708-000828-002 0008163 Run ID: MERC_000906B SeqNo: 51313

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	1.015	0.1	1	0	101.5%	75	125	0			

Sample ID: 0008163-02B MSD Batch ID: 1833 Test Code: EPA 7471A Units: mg/Kg Analysis Date 9/6/00 Prep Date: 9/5/00
 Client ID: 2708-000828-002 0008163 Run ID: MERC_000906B SeqNo: 51314

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	1	0.1	1	0	100.0%	75	125	1.015	1.5%	20	

Sample ID: 0008163-51B MS Batch ID: 1834 Test Code: EPA 7471A Units: mg/Kg Analysis Date 9/6/00 Prep Date: 9/5/00
 Client ID: 2708-000828-051 0008163 Run ID: MERC_000906C SeqNo: 51354

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	.97	0.1	1	0	97.0%	75	125	0			

Sample ID: 0008163-51B MSD Batch ID: 1834 Test Code: EPA 7471A Units: mg/Kg Analysis Date 9/6/00 Prep Date: 9/5/00
 Client ID: 2708-000828-051 0008163 Run ID: MERC_000906C SeqNo: 51355

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	1.03	0.1	1	0	103.0%	75	125	0.97	6.0%	20	

Sample ID: 0008163-59B MS Batch ID: 1837 Test Code: EPA 7471A Units: mg/Kg Analysis Date 9/6/00 Prep Date: 9/5/00
 Client ID: 2708-000828-059 0008163 Run ID: MERC_000906A SeqNo: 51295

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	.975	0.1	1	0	97.5%	75	125	0			

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

QC SUMMARY REPORT
 Sample Matrix Spike Duplicate

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

Sample ID: 0008163-59B MSD Batch ID: 1837 Test Code: EPA 7471A Units: mg/Kg Analysis Date 9/6/00 Prep Date: 9/5/00
 Client ID: 2708-000828-059 0008163 Run ID: MERC_000906A SeqNo: 51296

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	.975	0.1	1	0	97.5%	75	125	0.975	0.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CLIENT: Hahn & Associates
 Work Order: 0008163
 Project: NW Natural/Gasco

QC SUMMARY REPORT

Laboratory Control Spike Duplicate

Sample ID: LCSD Batch ID: 04 BG S-9/7/0 Test Code: 8015/8021 Units: µg/L Analysis Date 9/4/00 Prep Date:
 Client ID: 0008163 Run ID: CRICK_000904A SeqNo: 51455

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	19	2.5	20	0	95.0%	85	115	19.1	0.5%	20	
Ethylbenzene	19.5	2.5	20	0	97.5%	85	115	19.9	2.0%	20	
Toluene	19.2	2.5	20	0	96.0%	85	115	19.6	2.1%	20	
Xylenes, Total	58.5	7.5	60	0	97.5%	85	115	60.1	2.7%	20	

Sample ID: LCSD Batch ID: 04 BG S-9/7/0 Test Code: 8015/8021 Units: µg/L Analysis Date 9/5/00 Prep Date:
 Client ID: 0008163 Run ID: CRICK_000905A SeqNo: 51465

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	18.5	2.5	20	0	92.5%	85	115	18.1	2.2%	20	
Ethylbenzene	19.3	2.5	20	0	96.5%	85	115	18.9	2.1%	20	
Toluene	19.2	2.5	20	0	96.0%	85	115	18.8	2.1%	20	
Xylenes, Total	59.4	7.5	60	0	99.0%	85	115	58.3	1.9%	20	

Sample ID: LCSD Batch ID: 04 BG S-9/7/0 Test Code: 8015/8021 Units: µg/L Analysis Date 9/5/00 Prep Date:
 Client ID: 0008163 Run ID: WATSON_000905A SeqNo: 51474

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	19.6	2.5	20	0	98.0%	85	115	18.1	8.0%	20	
Ethylbenzene	20.3	2.5	20	0	101.5%	85	115	18.9	7.1%	20	
Toluene	20	2.5	20	0	100.0%	85	115	18.8	6.2%	20	
Xylenes, Total	61.3	7.5	60	0	102.2%	85	115	58.3	5.0%	20	

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS Batch ID: 04 BG S-9/8/0 Test Code: 8015/8021 Units: µg/L Analysis Date 9/6/00 Prep Date:
 Client ID: 0008163 Run ID: CRICK_000906A SeqNo: 51488

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	18.6	2.5	20	0	93.0%	85	115	0			
Ethylbenzene	19.1	2.5	20	0	95.5%	85	115	0			
Toluene	19.1	2.5	20	0	95.5%	85	115	0			
Xylenes, Total	58.2	7.5	60	0	97.0%	85	115	0			

Sample ID: LCSD Batch ID: 04 BG S-9/8/0 Test Code: 8015/8021 Units: µg/L Analysis Date 9/6/00 Prep Date:
 Client ID: 0008163 Run ID: CRICK_000906A SeqNo: 51489

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	18.6	2.5	20	0	93.0%	85	115	18.6	0.0%	20	
Ethylbenzene	19.1	2.5	20	0	95.5%	85	115	19.1	0.0%	20	
Toluene	19.1	2.5	20	0	95.5%	85	115	19.1	0.0%	20	
Xylenes, Total	58.3	7.5	60	0	97.2%	85	115	58.2	0.2%	20	

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

QC SUMMARY REPORT
Laboratory Control Spike - generic

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

Prep Date: 8/31/00

Analysis Date 9/5/00
SeqNo: 51150

Test Code: 8270-SIM Units: µg/Kg
Run ID: HEISENBURG_000905A

Batch ID: 1821
0008163

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Limit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	500	50	500	0	100.0%	47	145	0	0			
Acenaphthylene	495	50	500	0	99.0%	33	145	0	0			
Anthracene	520	50	500	0	104.0%	27	133	0	0			
Benzo(a)anthracene	515	50	500	0	103.0%	33	143	0	0			
Benzo(a)pyrene	340	50	500	0	68.0%	17	163	0	0			
Benzo(b)fluoranthene	465	50	500	0	93.0%	24	159	0	0			
Benzo(g,h,i)perylene	495	50	500	0	99.0%	1	219	0	0			
Benzo(k)fluoranthene	475	50	500	0	95.0%	11	162	0	0			
Chrysene	490	50	500	0	98.0%	17	168	0	0			
Dibenz(a,h)anthracene	485	50	500	0	97.0%	1	227	0	0			
Fluoranthene	490	50	500	0	98.0%	26	137	0	0			
Fluorene	510	50	500	0	102.0%	59	121	0	0			
Indeno(1,2,3-cd)pyrene	530	50	500	0	106.0%	1	171	0	0			
Naphthalene	505	50	500	0	101.0%	21	133	0	0			
Phenanthrene	440	50	500	0	88.0%	54	120	0	0			
Pyrene	485	50	500	0	97.0%	52	115	0	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

QC SUMMARY REPORT

Laboratory Control Spike Duplicate

CLIENT: Hahn & Associates
 Work Order: 0008163
 Project: NW Natural/Gasco

Sample ID: LCSD-1821 Batch ID: 1821 Test Code: 8270-SIM Units: µg/Kg Analysis Date 9/5/00 Prep Date: 8/31/00
 Client ID: 0008163 Run ID: HEISENBURG_000905A SeqNo: 51151

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	480	50	500	0	96.0%	47	145	500	4.1%	30	
Acenaphthylene	475	50	500	0	95.0%	33	145	495	4.1%	30	
Anthracene	530	50	500	0	106.0%	27	133	520	1.9%	30	
Benz(a)anthracene	500	50	500	0	100.0%	33	143	515	3.0%	30	
Benzo(a)pyrene	325	50	500	0	65.0%	17	163	340	4.5%	30	
Benzo(b)fluoranthene	450	50	500	0	90.0%	24	159	465	3.3%	30	
Benzo(g,h,i)perylene	470	50	500	0	94.0%	1	219	495	5.2%	30	
Benzo(k)fluoranthene	470	50	500	0	94.0%	11	162	475	1.1%	30	
Chrysene	480	50	500	0	96.0%	17	168	490	2.1%	30	
Dibenz(a,h)anthracene	485	50	500	0	97.0%	1	227	485	0.0%	30	
Fluoranthene	480	50	500	0	96.0%	26	137	490	2.1%	30	
Fluorene	490	50	500	0	98.0%	59	121	510	4.0%	30	
Indeno(1,2,3-cd)pyrene	515	50	500	0	103.0%	1	171	530	2.9%	30	
Naphthalene	475	50	500	0	95.0%	21	133	505	6.1%	30	
Phenanthrene	435	50	500	0	87.0%	54	120	440	1.1%	30	
Pyrene	460	50	500	0	92.0%	52	115	485	5.3%	30	

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CLIENT: Hahn & Associates
 Work Order: 0008163
 Project: NW Natural/Gasco

QC SUMMARY REPORT

Laboratory Control Spike Duplicate

Sample ID: LCSD-1821 Batch ID: 1821 Test Code: 8270-SIM Units: µg/Kg Analysis Date 9/5/00 Prep Date: 8/31/00
 Client ID: 0008163 Run ID: HEISENBURG_000905A SeqNo: 51151

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	480	50	500	0	96.0%	47	145	500	4.1%	30	
Acenaphthylene	475	50	500	0	95.0%	33	145	495	4.1%	30	
Anthracene	530	50	500	0	106.0%	27	133	520	1.9%	30	
Benz(a)anthracene	500	50	500	0	100.0%	33	143	515	3.0%	30	
Benzo(a)pyrene	325	50	500	0	65.0%	17	163	340	4.5%	30	
Benzo(b)fluoranthene	450	50	500	0	90.0%	24	159	465	3.3%	30	
Benzo(g,h,i)perylene	470	50	500	0	94.0%	1	219	495	5.2%	30	
Benzo(k)fluoranthene	470	50	500	0	94.0%	11	162	475	1.1%	30	
Chrysene	480	50	500	0	96.0%	17	168	490	2.1%	30	
Dibenz(a,h)anthracene	485	50	500	0	97.0%	1	227	485	0.0%	30	
Fluoranthene	480	50	500	0	96.0%	26	137	490	2.1%	30	
Fluorene	490	50	500	0	98.0%	59	121	510	4.0%	30	
Indeno(1,2,3-cd)pyrene	515	50	500	0	103.0%	1	171	530	2.9%	30	
Naphthalene	475	50	500	0	95.0%	21	133	505	6.1%	30	
Phenanthrene	435	50	500	0	87.0%	54	120	440	1.1%	30	
Pyrene	460	50	500	0	92.0%	52	115	485	5.3%	30	

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

QC SUMMARY REPORT

Laboratory Control Spike - generic

CLIENT: Hahn & Associates
 Work Order: 0008163
 Project: NW Natural/Gasco

Sample ID: LCS-1822 Batch ID: 1822 Test Code: EPA 6010B Units: mg/Kg Analysis Date 9/6/00 Prep Date: 9/1/00
 Client ID: 0008163 Run ID: ICP_000906A SeqNo: 51267

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	49.7	1	50	0	99.4%	80	120	0			
Arsenic	48.2	1	50	0	96.4%	80	120	0			
Beryllium	46.1	1	50	0	92.2%	80	120	0			
Cadmium	45.2	1	50	0	90.4%	80	120	0			
Chromium	48.6	1	50	0	97.2%	80	120	0			
Copper	49.7	1	50	0	99.4%	80	120	0			
Lead	46.1	1	50	0	92.2%	80	120	0			
Nickel	46.8	1	50	0	93.6%	80	120	0			
Selenium	44.3	1	50	0	88.6%	80	120	0			
Silver	49.5	1	50	0	99.0%	80	120	0			
Thallium	43.2	1	50	0	86.4%	80	120	0			

Sample ID: LCS-1823 Batch ID: 1823 Test Code: EPA 6010B Units: mg/Kg Analysis Date 9/6/00 Prep Date: 9/1/00
 Client ID: 0008163 Run ID: ICP_000906B SeqNo: 51618

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	92.9	1	100	0	92.9%	80	120	0			
Arsenic	89.8	1	100	0	89.8%	80	120	0			
Beryllium	88.9	1	100	0	88.9%	80	120	0			
Cadmium	85.9	1	100	0	85.9%	80	120	0			
Chromium	95.5	1	100	0	95.5%	80	120	0			
Copper	101	1	100	0	101.0%	80	120	0			
Lead	87.7	1	100	0	87.7%	80	120	0			
Nickel	90.7	1	100	0	90.7%	80	120	0			
Selenium	83.1	1	100	0	83.1%	80	120	0			
Silver	93.9	1	100	0	93.9%	80	120	0			
Thallium	82.8	1	100	0	82.8%	80	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CLIENT: Hahn & Associates
 Work Order: 0008163
 Project: NW Natural/Gasco

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID: LCS-1827 Batch ID: 1827 Test Code: 8270-SIM Units: µg/Kg Analysis Date 9/5/00 Prep Date: 9/1/00
 Client ID: 0008163 Run ID: HEISENBURG_000905A SeqNo: 51153

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	475	50	500	0	95.0%	47	145	0			
Acenaphthylene	475	50	500	0	95.0%	33	145	0			
Anthracene	535	50	500	0	107.0%	27	133	0			
Benz(a)anthracene	480	50	500	0	96.0%	33	143	0			
Benzo(a)pyrene	315	50	500	0	63.0%	17	163	0			
Benzo(b)fluoranthene	380	50	500	0	76.0%	24	159	0			
Benzo(g,h,i)perylene	460	50	500	0	92.0%	1	219	0			
Benzo(k)fluoranthene	535	50	500	0	107.0%	11	162	0			
Chrysene	490	50	500	0	98.0%	17	168	0			
Dibenz(a,h)anthracene	450	50	500	0	90.0%	1	227	0			
Fluoranthene	490	50	500	0	98.0%	26	137	0			
Fluorene	440	50	500	0	88.0%	59	121	0			
Indeno(1,2,3-cd)pyrene	490	50	500	0	98.0%	1	171	0			
Naphthalene	515	50	500	0	103.0%	21	133	0			
Phenanthrene	445	50	500	0	89.0%	54	120	0			
Pyrene	470	50	500	0	94.0%	52	115	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CLIENT: Hahn & Associates
 Work Order: 0008163
 Project: NW Natural/Gasco

QC SUMMARY REPORT

Laboratory Control Spike - generic

Sample ID:	LCS-1830	Batch ID:	1830	Test Code:	EPA 6010B	Units:	mg/Kg	Analysis Date	9/6/00	Prep Date:	9/1/00
Client ID:	0008163	Run ID:	ICP_000906B	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD RefVal	%RPD
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD RefVal	%RPD	RPDLimit	Qual
Antimony	49.7	1	50	0	99.4%	80	120	0			
Arsenic	49.1	1	50	0	98.2%	80	120	0			
Beryllium	48.9	1	50	0	97.8%	80	120	0			
Cadmium	47.5	1	50	0	95.0%	80	120	0			
Chromium	49.6	1	50	0	99.2%	80	120	0			
Copper	50.7	1	50	0	101.4%	80	120	0			
Lead	48.1	1	50	0	96.2%	80	120	0			
Nickel	48.6	1	50	0	97.2%	80	120	0			
Selenium	46.7	1	50	0	93.4%	80	120	0			
Silver	49.5	1	50	0	99.0%	80	120	0			
Thallium	45.3	1	50	0	90.6%	80	120	0			

Sample ID:	LCS-1833	Batch ID:	1833	Test Code:	EPA 7471A	Units:	mg/Kg	Analysis Date	9/6/00	Prep Date:	9/5/00
Client ID:	0008163	Run ID:	MERC_000906B	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD RefVal	%RPD
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD RefVal	%RPD	RPDLimit	Qual
Mercury	.495	0.1	0.5	0	99.0%	80	120	0			

Sample ID:	LCS-1834	Batch ID:	1834	Test Code:	EPA 7471A	Units:	mg/Kg	Analysis Date	9/6/00	Prep Date:	9/5/00
Client ID:	0008163	Run ID:	MERC_000906C	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD RefVal	%RPD
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD RefVal	%RPD	RPDLimit	Qual
Mercury	.465	0.1	0.5	0	93.0%	80	120	0			

Qualifiers:
 ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

QC SUMMARY REPORT

Laboratory Control Spike - generic

CLIENT: Hahn & Associates
 Work Order: 0008163
 Project: NW Natural/Gasco

Prep Date: 9/5/00

Analysis Date 9/8/00
 SeqNo: 51715

Test Code: 8270-SIM Units: µg/Kg
 Run ID: HEISENBURG_000908A

Batch ID: 1835
 0008163

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	385	50	500	0	77.0%	47	145	0			
Acenaphthylene	365	50	500	0	73.0%	33	145	0			
Anthracene	440	50	500	0	88.0%	27	133	0			
Benzo(a)anthracene	360	50	500	0	72.0%	33	143	0			
Benzo(a)pyrene	280	50	500	0	56.0%	17	163	0			
Benzo(b)fluoranthene	325	50	500	0	65.0%	24	159	0			
Benzo(g,h,i)perylene	370	50	500	0	74.0%	1	219	0			
Benzo(k)fluoranthene	535	50	500	0	107.0%	11	162	0			
Chrysene	425	50	500	0	85.0%	17	168	0			
Dibenz(a,h)anthracene	345	50	500	0	69.0%	1	227	0			
Fluoranthene	380	50	500	0	76.0%	26	137	0			
Fluorene	380	50	500	0	76.0%	59	121	0			
Indeno(1,2,3-cd)pyrene	360	50	500	0	72.0%	1	171	0			
Naphthalene	395	50	500	0	79.0%	21	133	0			
Phenanthrene	375	50	500	0	75.0%	54	120	0			
Pyrene	415	50	500	0	83.0%	52	115	0			

Qualifiers: N/D - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

S - Spike Recovery; outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

Sample ID: LCSD-1835 Batch ID: 1835 Test Code: 8270-SIM Units: µg/Kg Analysis Date 9/8/00 Prep Date: 9/5/00
Client ID: 0008163 Run ID: HEISENBURG_000908A SeqNo: 51716

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	415	50	500	0	83.0%	47	145	385	7.5%	30	
Acenaphthylene	405	50	500	0	81.0%	33	145	365	10.4%	30	
Anthracene	475	50	500	0	95.0%	27	133	440	7.7%	30	
Benzo(a)anthracene	400	50	500	0	80.0%	33	143	360	10.5%	30	
Benzo(a)pyrene	330	50	500	0	66.0%	17	163	280	16.4%	30	
Benzo(b)fluoranthene	340	50	500	0	68.0%	24	159	325	4.5%	30	
Benzo(g,h,i)perylene	400	50	500	0	80.0%	1	219	370	7.8%	30	
Benzo(k)fluoranthene	500	50	500	0	100.0%	11	162	535	6.8%	30	
Chrysene	450	50	500	0	90.0%	17	168	425	5.7%	30	
Dibenz(a,h)anthracene	400	50	500	0	80.0%	1	227	345	14.8%	30	
Fluoranthene	420	50	500	0	84.0%	26	137	380	10.0%	30	
Fluorene	360	50	500	0	72.0%	59	121	380	5.4%	30	
Indeno(1,2,3-cd)pyrene	400	50	500	0	80.0%	1	171	360	10.5%	30	
Naphthalene	415	50	500	0	83.0%	21	133	395	4.9%	30	
Phenanthrene	390	50	500	0	78.0%	54	120	375	3.9%	30	
Pyrene	445	50	500	0	89.0%	52	115	415	7.0%	30	

Sample ID: LCS-1837 Batch ID: 1837 Test Code: EPA 7471A Units: mg/Kg Analysis Date 9/6/00 Prep Date: 9/5/00
Client ID: 0008163 Run ID: MERC_000906A SeqNo: 51293

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	.485	0.1	0.5	0	97.0%	80	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits D - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Environmental Services Laboratory

QC SUMMARY REPORT
Continuing Calibration Blank

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

Sample ID: CCB Batch ID: 04 BG S-9/1/0 Test Code: 8015/8021 Units: µg/L Analysis Date 8/31/00 Prep Date:
Client ID: 0008163 Run ID: WATSON_000831A SeqNo: 50974

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	2.5	0	0	0.0%	0	0	0	0	0	0
Ethylbenzene	ND	2.5	0	0	0.0%	0	0	0	0	0	0
Toluene	ND	2.5	0	0	0.0%	0	0	0	0	0	0
Xylenes, Total	ND	7.5	0	0	0.0%	0	0	0	0	0	0
Trifluorotoluene	104	0	100	0	104.0%	70	130	0			

Sample ID: CCB Batch ID: 04 BG S-9/4/0 Test Code: 8015/8021 Units: µg/L Analysis Date 8/31/00 Prep Date:
Client ID: 0008163 Run ID: CRICK_000831A SeqNo: 50990

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	2.5	0	0	0.0%	0	0	0	0	0	0
Ethylbenzene	ND	2.5	0	0	0.0%	0	0	0	0	0	0
Toluene	ND	2.5	0	0	0.0%	0	0	0	0	0	0
Xylenes, Total	ND	7.5	0	0	0.0%	0	0	0	0	0	0
Trifluorotoluene	99.2	0	100	0	99.2%	70	130	0			

Sample ID: CCB Batch ID: 04 BG S-9/7/0 Test Code: 8015/8021 Units: µg/L Analysis Date 9/4/00 Prep Date:
Client ID: 0008163 Run ID: CRICK_000904A SeqNo: 51448

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	2.5	0	0	0.0%	0	0	0	0	0	0
Ethylbenzene	ND	2.5	0	0	0.0%	0	0	0	0	0	0
Toluene	ND	2.5	0	0	0.0%	0	0	0	0	0	0
Xylenes, Total	ND	7.5	0	0	0.0%	0	0	0	0	0	0
Trifluorotoluene	101	0	100	0	101.0%	70	130	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

QC SUMMARY REPORT
Continuing Calibration Blank

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

Sample ID: CCB **Batch ID:** 04 BG S-9/7/0 **Test Code:** 8015/8021 **Units:** µg/L **Analysis Date:** 9/5/00 **Prep Date:**
Client ID: 0008163 **Run ID:** CRICK_000905A **SeqNo:** 51457

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	2.5	0	0	0.0%	0	0	0			
Ethylbenzene	ND	2.5	0	0	0.0%	0	0	0			
Toluene	ND	2.5	0	0	0.0%	0	0	0			
Xylenes, Total	ND	7.5	0	0	0.0%	0	0	0			
Trifluorotoluene	99.9	0	100	0	99.9%	70	130	0			

Sample ID: CCB **Batch ID:** 04 BG S-9/7/0 **Test Code:** 8015/8021 **Units:** µg/L **Analysis Date:** 9/5/00 **Prep Date:**
Client ID: 0008163 **Run ID:** WATSON_000905A **SeqNo:** 51467

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	2.5	0	0	0.0%	0	0	0			
Ethylbenzene	ND	2.5	0	0	0.0%	0	0	0			
Toluene	ND	2.5	0	0	0.0%	0	0	0			
Xylenes, Total	ND	7.5	0	0	0.0%	0	0	0			
Trifluorotoluene	101	0	100	0	101.0%	70	130	0			

Sample ID: CCB **Batch ID:** 04 BG S-9/8/0 **Test Code:** 8015/8021 **Units:** µg/L **Analysis Date:** 9/6/00 **Prep Date:**
Client ID: 0008163 **Run ID:** CRICK_000906A **SeqNo:** 51482

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	2.5	0	0	0.0%	0	0	0			
Ethylbenzene	ND	2.5	0	0	0.0%	0	0	0			
Toluene	ND	2.5	0	0	0.0%	0	0	0			
Xylenes, Total	ND	7.5	0	0	0.0%	0	0	0			
Trifluorotoluene	96.6	0	100	0	96.6%	70	130	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

Environmental Services Laboratory

QC SUMMARY REPORT
Continuing Calibration Verification Standard

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

Sample ID: CCV Batch ID: 04 BG S-9/1/0 Test Code: 8015/8021 Units: µg/L Analysis Date 8/31/00 Prep Date:
Client ID: 0008163 Run ID: WATSON_000831A SeqNo: 50973

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	36.4	2.5	40	0	91.0%	85	115	0			
Ethylbenzene	38.5	2.5	40	0	96.3%	85	115	0			
Toluene	38	2.5	40	0	95.0%	85	115	0			
Xylenes, Total	118	7.5	120	0	98.3%	85	115	0			
Trifluorotoluene	100	0	100	0	100.0%	70	130	0			

Sample ID: CCV Batch ID: 04 BG S-9/4/0 Test Code: 8015/8021 Units: µg/L Analysis Date 8/31/00 Prep Date:
Client ID: 0008163 Run ID: CRICK_000831A SeqNo: 50989

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	38.1	2.5	40	0	95.3%	85	115	0			
Ethylbenzene	39.2	2.5	40	0	98.0%	85	115	0			
Toluene	39	2.5	40	0	97.5%	85	115	0			
Xylenes, Total	119	7.5	120	0	99.2%	85	115	0			
Trifluorotoluene	97.5	0	100	0	97.5%	70	130	0			

Sample ID: CCV Batch ID: 04 BG S-9/7/0 Test Code: 8015/8021 Units: µg/L Analysis Date 9/4/00 Prep Date:
Client ID: 0008163 Run ID: CRICK_000904A SeqNo: 51447

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	38.8	2.5	40	0	97.0%	85	115	0			
Ethylbenzene	40.2	2.5	40	0	100.5%	85	115	0			
Toluene	39.9	2.5	40	0	99.7%	85	115	0			
Xylenes, Total	122	7.5	120	0	101.7%	85	115	0			
Trifluorotoluene	99.4	0	100	0	99.4%	70	130	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV **Batch ID:** 04 BG S-9/7/0 **Test Code:** 8015/8021 **Units:** µg/L **Analysis Date:** 9/5/00 **Prep Date:**
Client ID: 0008163 **Run ID:** CRICK_000905A **SeqNo:** 51456

Analyte	Result	PQL	SPK value	SPK RefVal	%REC	LowLimit	HighLimit	RPD RefVal	%RPD	RPDLimit	Qual
Benzene	38.5	2.5	40	0	96.3%	85	115	0			
Ethylbenzene	39.9	2.5	40	0	99.7%	85	115	0			
Toluene	39.7	2.5	40	0	99.3%	85	115	0			
Xylenes, Total	121	7.5	120	0	100.8%	85	115	0			
Trifluorotoluene	96.1	0	100	0	96.1%	70	130	0			

Sample ID: CCV **Batch ID:** 04 BG S-9/7/0 **Test Code:** 8015/8021 **Units:** µg/L **Analysis Date:** 9/5/00 **Prep Date:**
Client ID: 0008163 **Run ID:** WATSON_000905A **SeqNo:** 51466

Analyte	Result	PQL	SPK value	SPK RefVal	%REC	LowLimit	HighLimit	RPD RefVal	%RPD	RPDLimit	Qual
Benzene	37.4	2.5	40	0	93.5%	85	115	0			
Ethylbenzene	39.3	2.5	40	0	98.2%	85	115	0			
Toluene	38.6	2.5	40	0	96.5%	85	115	0			
Xylenes, Total	119	7.5	120	0	99.2%	85	115	0			
Trifluorotoluene	101	0	100	0	101.0%	70	130	0			

Sample ID: CCV **Batch ID:** 04 BG S-9/8/0 **Test Code:** 8015/8021 **Units:** µg/L **Analysis Date:** 9/6/00 **Prep Date:**
Client ID: 0008163 **Run ID:** CRICK_000906A **SeqNo:** 51481

Analyte	Result	PQL	SPK value	SPK RefVal	%REC	LowLimit	HighLimit	RPD RefVal	%RPD	RPDLimit	Qual
Benzene	39.5	2.5	40	0	98.8%	85	115	0			
Ethylbenzene	40.9	2.5	40	0	102.3%	85	115	0			
Toluene	40.8	2.5	40	0	102.0%	85	115	0			
Xylenes, Total	124	7.5	120	0	103.3%	85	115	0			
Trifluorotoluene	101	0	100	0	101.0%	70	130	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

QC SUMMARY REPORT
Continuing Calibration Verification Standard

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

Sample ID: CCV **Batch ID:** 1818 **Test Code:** 8270-SIM **Units:** µg/L **Analysis Date:** 9/5/00 **Prep Date:**

Client ID: 0008163 **Run ID:** HEISENBURG_000905A **SeqNo:** 51148

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	.87	0.1	1	0	87.0%	80	120	0			
Acenaphthylene	.89	0.1	1	0	89.0%	80	120	0			
Anthracene	1.03	0.1	1	0	103.0%	80	120	0			
Benz(a)anthracene	.9	0.1	1	0	90.0%	80	120	0			
Benzo(a)pyrene	.88	0.1	1	0	88.0%	80	120	0			
Benzo(b)fluoranthene	.82	0.1	1	0	82.0%	80	120	0			
Benzo(g,h,i)perylene	.81	0.1	1	0	81.0%	80	120	0			
Benzo(k)fluoranthene	.95	0.1	1	0	95.0%	80	120	0			
Chrysene	.83	0.1	1	0	83.0%	80	120	0			
Dibenz(a,h)anthracene	.8	0.1	1	0	80.0%	80	120	0			
Fluoranthene	.86	0.1	1	0	86.0%	80	120	0			
Fluorene	.9	0.1	1	0	90.0%	80	120	0			
Indeno(1,2,3-cd)pyrene	.84	0.1	1	0	84.0%	80	120	0			
Naphthalene	.88	0.1	1	0	88.0%	80	120	0			
Phenanthrene	.81	0.1	1	0	81.0%	80	120	0			
Pyrene	.85	0.1	1	0	85.0%	80	120	0			
2-Fluorobiphenyl	.97	0.1	1	0	97.0%	30	115	0			
4-Terphenyl-d14	1.04	0.1	1	0	104.0%	18	137	0			
Nitrobenzene-d5	.95	0.1	1	0	95.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits

S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

QC SUMMARY REPORT

Continuing Calibration Verification Standard

Sample ID: CCV Batch ID: 1818 Test Code: 8270-SIM Units: µg/L Analysis Date 9/7/00 Prep Date:
 Client ID: 0008163 Run ID: HEISENBURG_000907B SeqNo: 51518

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD RefVal	%RPD	RPDLimit	Qual
Acenaphthene	.9	0.05	1	0	90.0%	80	120	0			
Acenaphthylene	.92	0.05	1	0	92.0%	80	120	0			
Anthracene	.92	0.05	1	0	92.0%	80	120	0			
Benz(a)anthracene	.84	0.05	1	0	84.0%	80	120	0			
Benzo(a)pyrene	.88	0.05	1	0	88.0%	80	120	0			
Benzo(b)fluoranthene	.88	0.05	1	0	88.0%	80	120	0			
Benzo(g,h,i)perylene	.87	0.05	1	0	87.0%	80	120	0			
Benzo(k)fluoranthene	.85	0.05	1	0	85.0%	80	120	0			
Chrysene	.9	0.05	1	0	90.0%	80	120	0			
Dibenz(a,h)anthracene	.84	0.05	1	0	84.0%	80	120	0			
Fluoranthene	.96	0.05	1	0	96.0%	80	120	0			
Fluorene	.85	0.05	1	0	85.0%	80	120	0			
Indeno(1,2,3-cd)pyrene	.88	0.05	1	0	88.0%	80	120	0			
Naphthalene	.9	0.05	1	0	90.0%	80	120	0			
Phenanthrene	.81	0.05	1	0	81.0%	80	120	0			
Pyrene	.84	0.05	1	0	84.0%	80	120	0			
2-Fluorobiphenyl	.97	0.1	1	0	97.0%	30	115	0			
4-Terphenyl-d14	.93	0.1	1	0	93.0%	18	137	0			
Nitrobenzene-d5	.98	0.1	1	0	98.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

QC SUMMARY REPORT
 Continuing Calibration Verification Standard

Sample ID: CCV Batch ID: 1818 Test Code: 8270-SIM Units: µg/L Analysis Date 9/9/00 Prep Date:
 Client ID: 0008163 Run ID: HEISENBURG_000909A SeqNo: 51750

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	.89	0.05	1	0	89.0%	80	120	0			
Acenaphthylene	.88	0.05	1	0	88.0%	80	120	0			
Anthracene	.81	0.05	1	0	81.0%	80	120	0			
Benz(a)anthracene	.96	0.05	1	0	96.0%	80	120	0			
Benzo(a)pyrene	.94	0.05	1	0	94.0%	80	120	0			
Benzo(b)fluoranthene	1.17	0.05	1	0	117.0%	80	120	0			
Benzo(g,h,i)perylene	.97	0.05	1	0	97.0%	80	120	0			
Benzo(k)fluoranthene	.9	0.05	1	0	90.0%	80	120	0			
Chrysene	.85	0.05	1	0	85.0%	80	120	0			
Dibenz(a,h)anthracene	.82	0.05	1	0	82.0%	80	120	0			
Fluoranthene	.8	0.05	1	0	80.0%	80	120	0			
Fluorene	.86	0.05	1	0	86.0%	80	120	0			
Indeno(1,2,3-cd)pyrene	.88	0.05	1	0	88.0%	80	120	0			
Naphthalene	.91	0.05	1	0	91.0%	80	120	0			
Phenanthrene	1.19	0.05	1	0	119.0%	80	120	0			
Pyrene	1.12	0.05	1	0	112.0%	80	120	0			
2-Fluorobiphenyl	1.02	0.1	1	0	102.0%	30	115	0			
4-Terphenyl-d14	1.01	0.1	1	0	101.0%	18	137	0			
Nitrobenzene-d5	1.02	0.1	1	0	102.0%	23	120	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

QC SUMMARY REPORT
 Continuing Calibration Verification Standard

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

Sample ID: CCV **Batch ID:** 1821 **Test Code:** 8270-SIM **Units:** µg/Kg **Analysis Date:** 9/10/00 **Prep Date:**
Client ID: 0008163 **Run ID:** HEISENBURG_000910A **SeqNo:** 51763

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	.92	0.05	1	0	92.0%	80	120	0			
Acenaphthylene	.91	0.05	1	0	91.0%	80	120	0			
Anthracene	.93	0.05	1	0	93.0%	80	120	0			
Benz(a)anthracene	.93	0.05	1	0	93.0%	80	120	0			
Benzo(a)pyrene	.94	0.05	1	0	94.0%	80	120	0			
Benzo(b)fluoranthene	.97	0.05	1	0	97.0%	80	120	0			
Benzo(g,h,i)perylene	.89	0.05	1	0	89.0%	80	120	0			
Benzo(k)fluoranthene	.95	0.05	1	0	95.0%	80	120	0			
Chrysene	.92	0.05	1	0	92.0%	80	120	0			
Dibenz(a,h)anthracene	.93	0.05	1	0	93.0%	80	120	0			
Fluoranthene	.96	0.05	1	0	96.0%	80	120	0			
Fluorene	.93	0.05	1	0	93.0%	80	120	0			
Indeno(1,2,3-cd)pyrene	.93	0.05	1	0	93.0%	80	120	0			
Naphthalene	.89	0.05	1	0	89.0%	80	120	0			
Phenanthrene	.94	0.05	1	0	94.0%	80	120	0			
Pyrene	.92	0.05	1	0	92.0%	80	120	0			
2-Fluorobiphenyl	1.04	0.1	1	0	104.0%	30	115	0			
4-Terphenyl-d14	1.09	0.1	1	0	109.0%	18	137	0			
Nitrobenzene-d5	.85	0.1	1	0	85.0%	23	120	0			

Sample ID: ICV **Batch ID:** 1833 **Test Code:** EPA 7471A **Units:** mg/Kg **Analysis Date:** 9/6/00 **Prep Date:** 9/5/00
Client ID: 0008163 **Run ID:** MERC_000906B **SeqNo:** 51309

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	1.02	0.1	1	0	102.0%	90	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CLIENT: Hahn & Associates
Work Order: 0008163
Project: NW Natural/Gasco

QC SUMMARY REPORT
 Continuing Calibration Verification Standard

Sample ID: ICV	Batch ID: 1834	Test Code: EPA 7471A	Units: mg/Kg	Analysis Date 9/6/00	Prep Date: 9/5/00						
Client ID:	0008163	Run ID: MERC_000906C		SeqNo: 51350							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	.985	0.1	1	0	98.5%	90	110	0			
Sample ID: ICV	Batch ID: 1837	Test Code: EPA 7471A	Units: mg/Kg	Analysis Date 9/6/00	Prep Date: 9/5/00						
Client ID:	0008163	Run ID: MERC_000906A		SeqNo: 51291							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	.95	0.1	1	0	95.0%	90	110	0			

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

Environmental Services Laboratory

Date: 12-Sep-00

CLIENT: Hahn & Associates
 Work Order: 0008163
 Project: NW Natural/Gasco

QC SUMMARY REPORT
 Initial Calibration Verification Standard

Sample ID: ICVLOW	Batch ID: 1822	Test Code: EPA 6010B	Units: mg/L	Analysis Date 9/6/00	Prep Date: 9/1/00			
Client ID: 0008163	Run ID: ICP_000906A	PQL	SPK value	SPK Ref Val	SeqNo: 51265			
Analyte	Result	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Antimony	.523	0.005	0.5	0	104.6%	90	110	0
Arsenic	.509	0.005	0.5	0	101.8%	90	110	0
Beryllium	.491	0.002	0.5	0	98.2%	90	110	0
Cadmium	.486	0.002	0.5	0	97.2%	90	110	0
Chromium	.51	0.005	0.5	0	102.0%	90	110	0
Copper	.498	0.005	0.5	0	99.6%	90	110	0
Lead	.497	0.005	0.5	0	99.4%	90	110	0
Nickel	.495	0.005	0.5	0	99.0%	90	110	0
Selenium	.508	0.005	0.5	0	101.6%	90	110	0
Silver	.501	0.005	0.5	0	100.2%	90	110	0
Thallium	.491	0.01	0.5	0	98.2%	90	110	0

Sample ID: ICVLOW	Batch ID: 1823	Test Code: EPA 6010B	Units: mg/L	Analysis Date 9/6/00	Prep Date: 9/1/00			
Client ID: 0008163	Run ID: ICP_000906B	PQL	SPK value	SPK Ref Val	SeqNo: 51616			
Analyte	Result	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Antimony	.522	0.005	0.5	0	104.4%	90	110	0
Arsenic	.511	0.005	0.5	0	102.2%	90	110	0
Beryllium	.493	0.002	0.5	0	98.6%	90	110	0
Cadmium	.486	0.002	0.5	0	97.2%	90	110	0
Chromium	.501	0.005	0.5	0	100.2%	90	110	0
Copper	.499	0.005	0.5	0	99.8%	90	110	0
Lead	.495	0.005	0.5	0	99.0%	90	110	0
Nickel	.494	0.005	0.5	0	98.8%	90	110	0
Selenium	.508	0.005	0.5	0	101.6%	90	110	0
Silver	.5	0.005	0.5	0	100.0%	90	110	0
Thallium	.489	0.01	0.5	0	97.8%	90	110	0

Qualifiers: ND - Not Detected at the Reporting Limit
 J - Analyte detected below quantitation limits
 S - Spike Recovery outside accepted recovery limits
 R - RPD outside accepted recovery limits
 B - Analyte detected in the associated Method Blank

ENVIRONMENTAL SERVICES LABORATORY -- GLOSSARY OF FLAGS

Qualifier Description

- AA This sample was analyzed after the holding time had expired.
- AB The hydrocarbon pattern in this sample is not typical of gasoline.
- AC The hydrocarbon pattern in this sample is not typical of diesel.
- AD The hydrocarbon pattern in this sample is not typical of oil.
- AE The hydrocarbon pattern in this sample extends into the gasoline range.
- AF The hydrocarbon pattern in this sample extends into the diesel range.
- AG The hydrocarbon pattern in this sample extends into the oil range.
- A This analysis was performed on a VOA sample containing headspace.
- B Analyte detected in the Method Blank above the reporting level.
- C The Relative Percent Difference (RPD) for the primary result and confirmation result was greater than 40%. The higher result was reported.
- D The sample was supplied in an inappropriate container, according to method criteria.
- E This value is above the quantitation limit. It is considered an estimate.
- H The Matrix Spike/Matrix Spike Duplicate (MS/MSD) result was outside control limits. The Laboratory Control Standard/Duplicate (LCS/LCSD) result was in control validating the batch.
- J The result is above the Method Detection Limit (MDL) and below the Reporting Level (RL). It is considered an estimate.
- M The MS/MSD recoveries are not calculable due to a high amount of analyte in sample.
- MI This indicates a high level of matrix interference affecting the spike or surrogate recovery.
- N See case narrative.
- O Detection Limits are elevated due to sample dilution. See case narrative.
- Q Further inspection of the sample confirms a non-homogenous sample matrix affecting RPD result.
- R The RPD result is outside method control limits. See other qualifiers or case narrative.
- S The spike recovery is outside method control limits. See other qualifiers or case narrative.
- T The RPD between the sample result and duplicate result was greater than 20%. The original result was less than three times the reporting level, therefore the RPD is not applicable.
- X Unable to quantitate surrogate recovery due to sample dilution.



September 26, 2000

Service Request No: K2006794

Nichole Karl
ESL Oregon
174000 SW Upper Boones Ferry Rd., Suite 270
Portland, OR 97224

Re: 0008163

Dear Nichole:

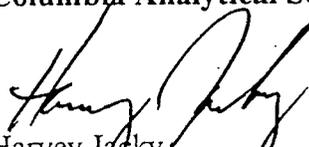
Enclosed are the results of the sample(s) submitted to our laboratory on September 01, 2000. For your reference, these analyses have been assigned our service request number K2006794.

All analyses were performed according to our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions. My extension is 3260.

Respectfully submitted,

Columbia Analytical Services, Inc.


Harvey Jacky
Project Chemist

HJ/gl

Page 1 of 8

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

00002

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- i The MRL/MDL has been elevated due to a matrix interference.
- X See case narrative.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- B The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- E The reported value is estimated because of the presence of matrix interference.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- i The MRL/MDL has been elevated due to a matrix interference.
- X See case narrative.
- * The duplicate analysis not within control limits. See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides).
- U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
- i The MRL/MDL has been elevated due to a matrix interference.
- X See case narrative.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

00003

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ESL Oregon
Project: 8163
Sample Matrix: Soil

Service Request: K2006794
Date Collected: 8/28/00
Date Received: 9/1/00
Date Extracted: NA
Date Analyzed: 9/19/00

Carbon, Total Organic
ASTM D4129-82M
Units: PERCENT
Dry Weight Basis

Sample Name	Lab Code	MRL	Result
0008163-03	K2006794-001	0.05	0.22
0008163-06	K2006794-002	0.05	0.18
0008163-09	K2006794-003	0.05	0.45
0008163-12	K2006794-004	0.05	0.80
0008163-16	K2006794-005	0.05	5.23
0008163-22	K2006794-007	0.05	0.39
0008163-25	K2006794-008	0.05	0.85
0008163-28	K2006794-009	0.05	0.44
0008163-32	K2006794-011	0.05	17.9
0008163-35	K2006794-012	0.05	27.9
0008163-37	K2006794-013	0.05	4.56
0008163-42	K2006794-014	0.05	0.35
0008163-43	K2006794-015	0.05	1.21
0008163-45	K2006794-016	0.05	2.47
0008163-48	K2006794-017	0.05	1.49
0008163-53	K2006794-018	0.05	42.0
0008163-57	K2006794-019	0.05	3.85
0008163-59	K2006794-020	0.05	0.26
Method Blank	K2006794-MB	0.05	ND

M Modified for analysis of soil.

Approved By: _____



Date: _____

9/25/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ESL Oregon
Project: 8163
Sample Matrix: Soil

Service Request: K2006794
Date Collected: 8/28/00
Date Received: 9/1/00
Date Extracted: NA

Inorganic Parameters

Analyte:	Density	Specific Gravity	Porosity
EPA Method:	ASTM E1109 - 86	ASTM D854-83	ASA 921-2.2
Method Reporting Limit:	0.01	0.01	0.01
Date Analyzed:	9/25/00	9/29/00	9/25,29/00
Units:	g/mL	-	%

Sample Name	Lab Code	Density	Specific Gravity	Porosity
0008163-03	K2006794-001	1.13	2.22	51
0008163-09	K2006794-003	1.04	1.89	55
0008163-16	K2006794-005	1.03	1.74	59
0008163-19	K2006794-006	1.26	1.79	70
0008163-22	K2006794-007	1.06	1.87	57
0008163-25	K2006794-008	1.05	2.00	53
0008163-29	K2006794-010	1.32	1.37	96
0008163-35	K2006794-012	1.01	1.56	65
0008163-42	K2006794-014	1.04	1.80	58
0008163-59	K2006794-020	1.17	2.04	57

Approved By: _____  Date: 3/1/01

00006

17400 SW Upper Boones Ferry Rd., Suite 270
 Portland, Oregon 97224 • (503) 670-8520 FAX: (503) 670-9243

LABORATORY NUMBER: 2006796

ESL Project Manager: Nichole Karl

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	PCB	Karl Fisher	TOC (EPA 415.2)	Sulfide	BOD	Coliform:	F. Coll	TKN	dry bulk density (ASTM D2937)	spec. grav./porosity (ASTM D854 / ASA#921+22)
0008163 - 03	8/28		Soil				X X X X X						X	X
- 06							X X X X X						X	X
- 09							X X X X X						X	X
- 12							X X X X X						X	X
- 16							X X X X X						X	X
- 19							X X X X X						X	X
- 22							X X X X X						X	X
- 25							X X X X X						X	X
- 28							X X X X X						X	X
- 29							X X X X X						X	X
- 32							X X X X X						X	X
- 35							X X X X X						X	X
- 37							X X X X X						X	X

PROJECT INFORMATION

PROJECT NUMBER: 0008 (63)

PROJECT NAME:

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS
 COC SEALS/INTACT? Y/N/NA
 RECEIVED INTACT? Y/N
 RECEIVED COLD? Y/N

Results by:

RELINQUISHED BY:	1.	2.
Signature:	Time	Time
Nichole Karl	11:00	
Printed Name:	Date	Date
Nichole Karl	8/31	
Company: ESL OR		
RECEIVED BY:	1.	2.
Signature:	Time	Time
[Signature]	1030	
Printed Name:	Date	Date
[Signature]	9/1/00	
Company: CAS		

ESL - UKE'GON

TO: CAS

Chain of Custody

17400 SW Upper Boones Ferry Rd., Suite 270
Portland, Oregon 97224 • (503) 670-8520 FAX: (503) 670-9243

LABORATORY NUMBER: 20067974

ESL Project Manager: Nichole Karl

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	PCB	Karl Fisher	TOC (FR 415.2)	Sulfide	BOD	Coliform:	E. Coll	TKN	bulk density	spec-grav / porosity
0008163-42	8/28		Sol 1				X X X X X X X X						X	X
-43														
-45														
-48														
-53														
-57														
-59														

PROJECT INFORMATION

PROJECT NUMBER: 0008163
PROJECT NAME:

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS
COC SEALS/INTACT? Y/N/N/A
RECEIVED INTACT? Y/N
RECEIVED COLD? Y/N

RELINQUISHED BY:	1.	2.
Signature:	Nichole Karl	
Printed Name:	Nichole Karl	
Company:	ESL - OR	
Signature:	[Signature]	
Printed Name:	[Name]	
Company:	CAS	
Time	11:50	
Date	8/31	
Time	1030	
Date	9/1/08	

Results by:

Environmental Service Laboratory, Inc.

17400 SW Upper Boones Ferry Rd.
Suite 270
Portland, OR 97224
Tel: (503)670-8520
Fax: (503)670-9243

DATE: 3/2/01
TO: Rob
FROM: Keith

MESSAGE:

Rob - The porosity is defined as density divided by specific gravity, so the result is percent substance, not percent space.

Specific gravity is a ratio of density to the density of water, usually, so can either be a unit-less number as expressed here, or can be expressed in grams per milliliter.

Hard copy of CAT's report due here Monday.

RECEIVED SEP 13 2000



Environmental Services Laboratory, Inc.

17400 SW Upper Boones Ferry Road • Suite 270 • Portland, OR 97224 • (503) 670-8520

September 12, 2000

Mr. Rob Ede
Hahn & Associates
434 N.W. 6th Avenue
Suite 203
Portland, OR 97209
TEL: (503)796-0717
FAX (503) 227-2209

RE: NW Natural/Gasco

Order No.: 0008163

Dear Mr. Rob Ede,

Environmental Services Laboratory received 65 samples on 8/30/00 for the analyses presented in the following report.

The Samples were analyzed for the following tests:

- GAS/BTEX, Soil (8015/8021)
- ICP Metals (EPA 6010B)
- Mercury (EPA 7471A)
- Misc. Costs - see comments section (SWSUB)
- ORGANIC CARBON, Total (D2974)
- PAH BY SIM, Soil (8270-SIM)
- PERCENT MOISTURE (SM 2540)

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative. Results apply only to the samples analyzed. Reproduction of this report is permitted only in its entirety, without the written approval from the Laboratory.

If you have any questions regarding these test results, please feel free to call.

Sincerely,

Nichole Karl

Nichole Karl
Project Manager

Keith Hunter
Technical Review

ANALYTICAL SERVICES FOR THE ENVIRONMENT