PNG ENVIRONMENTAL, INC.

December 24, 2003 1052-01

Mr. Greg Stewart and Mr. Rob Grenley
Grenley Stewart Resources
1019 Pacific Avenue, 13th Floor
Tacoma, Washington 98402-4443

Subject: **Second Post-ORC Injection Quarterly Groundwater Monitoring Report**
Fife Metroplex Card Lock Fuel Sales Facility
3200 20th Street East
Fife, Washington

Dear Sirs:

This letter describes the results of the second post-ORC injection quarterly groundwater-sampling event at the above referenced site in Fife, Washington. The following tasks were performed on November 17, 2003:

- Collection of groundwater level measurements at the six site monitoring wells (MW-1 through MW-6) and the drainage ditch located at the site
- Collection of groundwater samples at the site wells for gasoline range hydrocarbons and benzene, toluene, ethylbenzene, total xylenes [BTEX], and MTBE analysis
- Preparation of a groundwater elevation contour plot from water level measurements collected on November 17, 2003

GROUNDWATER CONDITIONS

Water levels were measured prior to sample collection on November 17, 2003. Water level measurements ranged between 5.99 to 7.91 feet below ground surface (bgs) at the site wells and 2.03 feet bgs at the ditch, as summarized on Table 1. PNG Environmental, Inc. prepared a groundwater elevation plot from this data set (Figure 1). Groundwater appears to be mounded around monitoring well MW-6. Groundwater flow radiates out from the mound in a south, west, and northern direction. The cause for this mounding affect is currently unknown. PNG will continue to monitor groundwater flow direction at the site to further assess groundwater conditions over time.

Groundwater Sampling

On November 17, 2003, PNG collected groundwater samples from the six site monitoring wells. Prior to sampling, the cap of each well was removed and the water was allowed to stabilize prior to collecting depth to water measurements. The volume of water in the wells was calculated and approximately three casing volumes of water were purged with a peristaltic pump. A new length of LDPE tubing was used in each well. The water purged from each well was relatively clear with a yellow hue and there was no noticeable sheen or chemical odor observed during sampling activities. All purge water generated during sampling activities was placed in a labeled 55-gallon drum that is currently stored at the site.

Groundwater samples from the wells were collected with new, disposable polyethylene bailers. Samples were carefully transferred into laboratory-prepared sample containers. The samples were placed in an iced cooler and delivered to Friedman & Bruya Laboratory along with chain-of-custody documentation.

The samples were analyzed for the following constituents:

- Gasoline Range Organics (GRO) using Northwest Method NWTPH-Gx
- BTEX and MTBE using EPA Method 8260B
- Field parameters: pH, conductivity, temperature, dissolved oxygen, and oxygen release potential

A summary of depth to water measurements and calculated groundwater elevation at each well is found in Table 1. Groundwater Sample Collection Forms documenting field activities are included in Attachment A.

Analytical Results

Groundwater analytical results indicated that GRO (up to 310 ug/L), benzene (up to 390 ug/L), toluene (up to 6 ug/L), and total xylenes (up to 6 ug/L) were detected in monitoring wells MW-3 and MW-4. MTBE (up to 140 ug/L) was detected in monitoring wells MW-2 through MW-4. The highest concentration of gasoline range organics and benzene in groundwater is found at MW-3. The dissolved oxygen concentrations ranged from 0.1 to 4.6 parts per million (ppm), with the highest concentrations found at MW-5. The oxygen release potential (ORP) in groundwater ranged from -59 to 83 millivolts. The field parameters are documented on the Groundwater Sample Collection forms found in Attachment A. A summary of the analytical results is presented on Table 2. A copy of the laboratory report is included in Attachment B.

DISCUSSION

Analytical results of the second post-ORC injection sampling event showed a general improvement in water quality compared to the first post-ORC injection-sampling event performed on August 20, 2003. The concentration of benzene and gasoline range organics has decreased in MW-3 and MW-4. MTBE concentrations were at similar concentrations compared to the previous sampling event. PNG will continue to monitor groundwater conditions at the site to see if the trend towards improving groundwater quality is sustained.

The cause of the observed mounding of groundwater near monitoring well MW-6 is currently unknown. PNG will be able to better characterize groundwater flow patterns at the site over time with the collection of more data.

PNG appreciates the opportunity to assist you on this project. Please call (360) 414-0669 if you have any questions or comments.

Sincerely,

PNG ENVIRONMENTAL, INC.

Craig Hultgren, R.G.
Project Manager

for PM
Paul McBeth, R.G.
President

Attachments: Table 1 - Groundwater Levels and Elevation
Table 2 - Summary of Groundwater Analytical Results
Figure 1 - Site Map
Attachment A - Groundwater Collection Sampling Forms
Attachment B - Laboratory Report and Chain-of-Custody Documentation

cc: Ms. Beth Muhler, IUM

TABLES

Table 1
Depth to Groundwater Measurements
Card Lock Fuel Sales Facility
Fife, Washington

Depth

Well	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	Ditch
Casing Elevation[1]	12.01	12.48	13.65	12.87	11.62	12.90	7.50
10/10/2002[2]	9.05	9.24	10.44	9.48	8.75	9.50	NM
1/9/2003[2]	6.22	6.83	7.88	6.91	5.51	6.78	NM
5/20/2003	6.49	7.10	8.15	7.18	5.90	7.16	2.30
8/20/2003	7.11	7.74	8.82	7.84	6.73	7.88	2.82
11/17/2003	6.59	6.99	7.91	7.07	5.99	7.04	2.03

Water Elevation

Well	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	Ditch
Casing Elevation[1]	12.01	12.48	13.65	12.87	11.62	12.90	7.50
10/10/2002[2]	2.96	3.24	3.21	3.39	2.87	3.40	NM
1/9/2003[2]	5.79	5.65	5.77	5.96	6.11	6.12	NM
5/20/2003	5.52	5.38	5.50	5.69	5.72	5.74	5.20
8/20/2003	4.90	4.74	4.83	5.03	4.89	5.02	4.68
11/17/2003	5.42	5.49	5.74	5.80	5.63	5.86	5.47

Notes:
[1] Elevations are relative to a City of Tacoma control point in NE 20th Street
The elevation of the control point is relative the NGVD29 vertical datum
[2] Measurements collected by Saltbush Environmental Services, Inc.
NM = Not measured

Table 2
Summary of Groundwater Analytical Results - (ug/L)
Card Lock Fuels Sales Facility
Fife, Washington

Sample Identification	MTCA	MW-1					MW-2			
Date Sampled	Method A	10/10/02	01/09/03	05/20/03	08/20/03	11/17/03	10/10/02	01/09/03	08/20/03	11/17/03
Parameters	Cleanup Standard									
Gasoline Range Organics	800	100 U	ND	NA	250 U	50 U	100 U	ND	250 U	50 U
Benzene	5	1.0 U	ND	NA	1.0 U	1.0 U	1.0 U	ND	1.0 U	1.0 U
Toluene	1,000	1.0 U	2.4	NA	1.0 U	1.0 U	1.0 U	ND	1.0 U	1.0 U
Ethylbenzene	700	1.0 U	ND	NA	1.0 U	1.0 U	1.0 U	ND	1.0 U	1.0 U
Total Xylenes	1,000	1.0 U	4.3	NA	2.0 U	2.0 U	1.0 U	ND	2.0 U	2.0 U
Methyl t-butyl ether (MTBE)	20	1.0 U	ND	NA	1.0 U	1.0 U	1.0 U	32	1.0	1.0

Notes:
ug/L = Micrograms per liter
U = Undetected at method limit shown
NA = Not analyzed
Values in bold indicate the compound concentration exceeds the referenced Cleanup Standard
Gasoline range hydrocarbons by NWTPH-Gx
BTEX and MTBE by EPA Method 8260B

Table 2
Summary of Groundwater Analytical Results - (ug/L)
Card Lock Fuels Sales Facility
Fife, Washington

Sample Identification	MTCA	MW-3					MW-4				
Date Sampled	Method A	10/10/02	01/09/03	05/20/03	08/20/03	11/17/03	10/10/02	01/09/03	05/20/03	08/20/03	11/17/03
Parameters	Cleanup Standard										
Gasoline Range Organics	800	1,300	3,900	1,600	680	310	100 U	ND	50 U	250 U	50 U
Benzene	5	360	2,900	700	610	390	14	33	11	4.0	1.0
Toluene	1,000	1.0 U	1.1	10 U	1.0 U	1.0 U	1.0 U	ND	1.0 U	1.0 U	6.0
Ethylbenzene	700	1.0 U	ND	10 U	1.0 U	1.0 U	1.0 U	ND	1.0 U	1.0 U	1.0 U
Total Xylenes	1,000	42	5.4	20 U	3.0	2.0	2.0	ND	2.0 U	2.0 U	6.0
Methyl t-butyl ether (MTBE)	20	1.0 U	140	160	170	130	1.0 U	160	130	140	140

Notes:
ug/L = Micrograms per liter
U = Undetected at method limit shown
NA = Not analyzed
Values in bold indicate the compound concentration
Gasoline range hydrocarbons by NWTPH-Gx
BTEX and MTBE by EPA Method 8260B

Table 2
Summary of Groundwater Analytical Results - (ug/L)
Card Lock Fuels Sales Facility
Fife, Washington

Sample Identification	MTCA	MW-5					MW-6				
Date Sampled	Method A	10/10/02	01/09/03	05/20/03	08/20/03	11/17/03	10/10/02	01/09/03	05/20/03	08/20/03	11/17/03
Parameters	Cleanup Standard										
Gasoline Range Organics	800	100 U	ND	NA	250 U	50 U	100 U	ND	NA	250 U	50 U
Benzene	5	1.0 U	ND	NA	1.0 U	1.0 U	1.0 U	ND	NA	1.0 U	1.0 U
Toluene	1,000	1.0 U	ND	NA	1.0 U	1.0 U	1.0 U	ND	NA	1.0 U	1.0 U
Ethylbenzene	700	1.0 U	ND	NA	1.0 U	1.0 U	1.0 U	ND	NA	1.0 U	1.0 U
Total Xylenes	1,000	1.0 U	ND	NA	2.0 U	2.0 U	1.0 U	ND	NA	2.0 U	2.0 U
Methyl t-butyl ether (MTBE)	20	1.0 U	ND	NA	1.0 U	1.0 U	1.0 U	ND	NA	1.0 U	1.0 U

Notes:
ug/L = Micrograms per liter
U = Undetected at method limit shown
NA = Not analyzed
Values in bold indicate the compound concentration
Gasoline range hydrocarbons by NWTPH-Gx
BTEX and MTBE by EPA Method 8260B

Table 3
Groundwater Analytical Results - VOCs (ug/L)
Card Lock Fuel Sales Facility
Fife, Washington

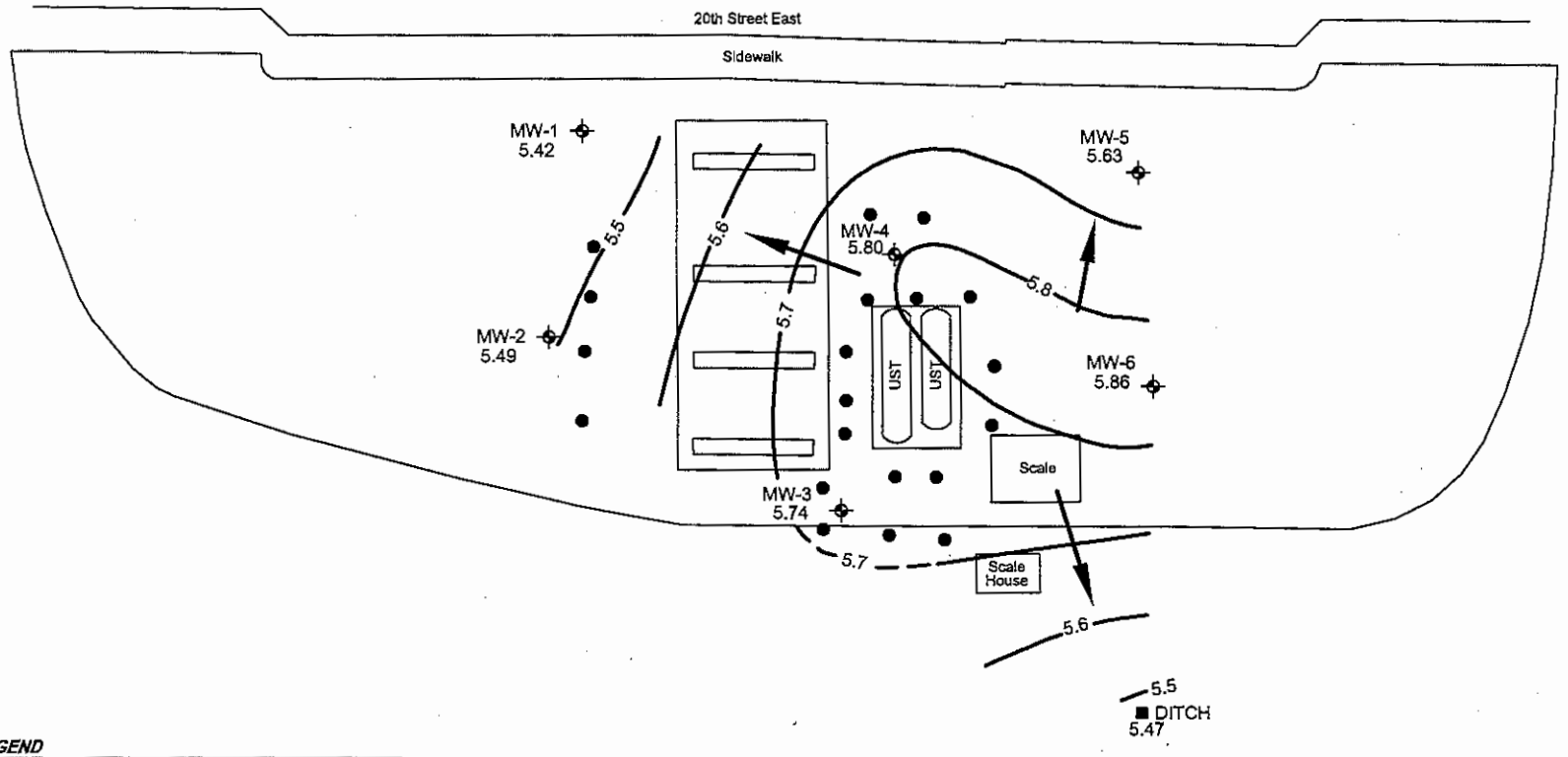
Sample Identification	MW-1 NA	MW-2 NA	MW-3 5/20/03	MW-4 5/20/03	MW-5 NA	MW-6 NA	Cleanup Standard[1]
Dichlorodifluoromethane	NA	NA	10 U	1 U	NA	NA	
Chloromethane	NA	NA	10 U	1 U	NA	NA	
Vinyl Chloride	NA	NA	10 U	1 U	NA	NA	
Bromomethane	NA	NA	10 U	1 U	NA	NA	
Chloroethane	NA	NA	10 U	1 U	NA	NA	
Trichlorofluoromethane	NA	NA	10 U	1 U	NA	NA	
Acetone	NA	NA	500 U	10 U	NA	NA	
1,1-Dichloroethene	NA	NA	10 U	1 U	NA	NA	
Methylene Chloride	NA	NA	50 U	5 U	NA	NA	
Methyl t-butyl ether (MTBE)	NA	NA	**160**	**130**	NA	NA	**20**
trans-1,2-Dichloroethene	NA	NA	10 U	1 U	NA	NA	
1,1-Dichloroethane	NA	NA	10 U	1 U	NA	NA	
2,2-Dichloropropane	NA	NA	10 U	1 U	NA	NA	
2-Butanone (MEK)	NA	NA	100 U	10 U	NA	NA	
1,2-Dichloropropane	NA	NA	10 U	1 U	NA	NA	
cis-1,2-Dichloroethene	NA	NA	10 U	1 U	NA	NA	
Chloroform	NA	NA	10 U	1 U	NA	NA	
1,1,1-Trichloroethane (TCA)	NA	NA	10 U	1 U	NA	NA	
1,1-Dichloropropene	NA	NA	10 U	1 U	NA	NA	
Carbon Tetrachloride	NA	NA	10 U	1 U	NA	NA	
1,2-Dichloroethane (EDC)	NA	NA	10 U	1 U	NA	NA	
Benzene	NA	NA	**700**	11 U	NA	NA	**5**
Trichloroethene (TCE)	NA	NA	10 U	1 U	NA	NA	
1,2-Dichloropropane	NA	NA	10 U	1 U	NA	NA	
Bromodichloromethane	NA	NA	10 U	1 U	NA	NA	
Dibromomethane	NA	NA	10 U	1 U	NA	NA	
2-Hexanone	NA	NA	100 U	10 U	NA	NA	
cis-1,3-Dichloropropene	NA	NA	10 U	1 U	NA	NA	
Toluene	NA	NA	10 U	1 U	NA	NA	**1,000**
trans 1,3-Dichloropropene	NA	NA	10 U	1 U	NA	NA	
1,1,2-Trichloroethane	NA	NA	10 U	1 U	NA	NA	
4-Methyl-2-Pentanone (MIBK)	NA	NA	10 U	10 U	NA	NA	
1,3-Dichloropropane	NA	NA	10 U	1 U	NA	NA	
Tetrachloroethene (PCE)	NA	NA	10 U	1 U	NA	NA	
Dibromochloromethane	NA	NA	10 U	1 U	NA	NA	
1,2-Dibromoethane (EDB)	NA	NA	10 U	1 U	NA	NA	
Chlorobenzene	NA	NA	10 U	1 U	NA	NA	
1,1,1,2-Tetrachloroethane	NA	NA	10 U	1 U	NA	NA	
Ethylbenzene	NA	NA	10 U	1 U	NA	NA	**700**
m,p-Xylenes	NA	NA	10 U	1 U	NA	NA	
o-Xylenes	NA	NA	10 U	1 U	NA	NA	**1,000**
Styrene	NA	NA	10 U	1 U	NA	NA	
Bromoform	NA	NA	10 U	1 U	NA	NA	
Isopropylbenzene	NA	NA	10 U	1 U	NA	NA	
1,1,2,2-Tetrachloroethane	NA	NA	10 U	1 U	NA	NA	
1,2,3-Trichloropropane	NA	NA	10 U	1 U	NA	NA	
Bromobenzene	NA	NA	10 U	1 U	NA	NA	
n-Propylbenzene	NA	NA	10 U	1 U	NA	NA	
2-Chlorotoluene	NA	NA	10 U	1 U	NA	NA	
4-Chlorotoluene	NA	NA	10 U	1 U	NA	NA	

Table 3
Groundwater Analytical Results - VOCs (ug/L)
Card Lock Fuel Sales Facility
Fife, Washington

Sample Identification	MW-1 NA	MW-2 NA	MW-3 5/20/03	MW-4 5/20/03	MW-5 NA	MW-6 NA	Cleanup Standard[1]
1,3,5-Trimethylbenzene	NA	NA	10 U	1 U	NA	NA	
tert-Butylbenzene	NA	NA	10 U	1 U	NA	NA	
1,2,4-Trimethylbenzene	NA	NA	43	1 U	NA	NA	
sec-Butylbenzene	NA	NA	10 U	1 U	NA	NA	
p-Isopropyltoluene	NA	NA	10 U	1 U	NA	NA	
1,3-Dichlorobenzene	NA	NA	10 U	1 U	NA	NA	
1,4-Dichlorobenzene	NA	NA	10 U	1 U	NA	NA	
1,2-Dichlorobenzene	NA	NA	10 U	1 U	NA	NA	
1,2-Dibromo-3-chloropropane	NA	NA	10 U	1 U	NA	NA	
1,2,4,-Trichlorobenzene	NA	NA	10 U	1 U	NA	NA	
1,2,3,-Trichlorobenzene	NA	NA	10 U	1 U	NA	NA	
Naphthalene	NA	NA	10 U	1 U	NA	NA	160
Hexachlorobutadiene	NA	NA	10 U	1 U	NA	NA	

Notes:
[1] MTCA Method A Cleanup Standards
ug/L = Micrograms per liter (parts per billion)
VOCs = Volatile Organic Compounds
U = Not detected at method reporting limit shown
NA = Not analyzed
Values in bold indicate the compound concentration results exceeded the MTCA Method A Cleanup Standards
The Cleanup Standard for xylenes is for total xylenes
Volatile Organic Compound analysis by EPA Method 8260B.

FIGURE



LEGEND

- MW-1 ⊕ MONITORING WELL
- ● INJECTION POINT
- 5.6 —— GROUNDWATER ELEVATION CONTOUR
- 5.49 GROUNDWATER ELEVATION
- ▭ PUMP ISLAND
- GROUNDWATER FLOW DIRECTION
- ■ DITCH

NOTE:
BASE MAP FROM BLUHM & ASSOCIATES
LAND SURVEYORS, INC. JUNE 13, 2003.

APPROXIMATE SCALE IN FEET

0 20 40 80

N

PNG ENVIRONMENTAL INC.
1339 Commerce Avenue, Suite 313
Longview, Washington 98632
TEL (360) 414-0669
FAX (360) 414-0663

DATE: 12/04/03
FILE NAME: 105201-BASE
DRAWN BY: MM
APPROVED BY: CH

FIFE CARDLOCK FUEL FACILITY
3200 20TH ST. EAST
FIFE, WASHINGTON

GROUNDWATER ELEVATION CONTOUR
NOVEMBER 17, 2003

Project No. 1052-01
Figure No. 1

ATTACHMENT A
GROUNDWATER SAMPLE COLLECTION FORMS

GROUNDWATER
SAMPLE COLLECTION FORM

Well ID no MW-1 Project name FIFE
Sample no. MW-1 Project no. 1052
Date 11-17-03 Collector JWZ

Well Information
Monument condition ☑ Good ☐ Needs repair _____
Well cap condition ☑ Good ☐ Locked ☐ Replaced ☐ Needs replacement
Headspace reading ☑ Not measured _____ ppm
Elevation mark ☑ Yes ☐ Added ☐ Other _____
Well diameter ☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other _____
☐ Odor _____ ☐ Comments _____

Purge Data
Total well depth 15.30 ft ☐ Clean bottom ☐ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 6.59 ft
Casing volume 8.71 ft (H_2O) X .16 gpf = 1.39 X 3 = 4.18
Casing volumes 3/4"=0.02 gpf 2"=0.16 gpf 4"=0.65 gpf 6"= 1.47 gpf

Purge Method
Pump type ☑ Peristaltic ☐ Centrifugal ☐ Submersible ☐ Other _____
Purge tubing ☑ New LDPE ☐ New HDPE ☐ New Teflon ☐ New Tygon ☐ Other _____
Bailer type ☐ Disposable ☐ Teflon ☐ Stainless ☐ PVC ☐ Other _____
Purge start time 1530 Purge stop time 1537 Purge rate 3/4 gpm

Field Parameters
Meter used ☐ HYDAC ☐ pH2Tester ☐ Hach ☑ Other Horiba

Gallons	pH	Temperature	Conductivity	Comments
1	6.57	56.9	1.90	Yellow/orange
2	6.53	60.7	2.06	
4+	6.53	62.5	2.06	

Dissolved Oxygen 0.0 ~~Carbon Dioxide~~ ORP -28

Sampling Device
Bailer ☑ Disposable ☐ Stainless ☐ Teflon ☐ Other _____
Filter Type _____ Size _____ (micron) ☐ Other _____
Bailer cord used ☐ Monofillament ☐ Other _____

Bottles Filled Time 1543

Number	Type	Preservative	Filtration
4	☑ VOA ☐ Amber ☐ Poly	HCL ☑ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No

Sampler's Signature JWZ Date 11/17/03

GROUNDWATER
SAMPLE COLLECTION FORM

Well ID no MW-2 Project name FIFE
Sample no. MW-2 Project no. 1052
Date 11-17-03 Collector JWZ

Well Information
Monument condition ☑ Good ☐ Needs repair ____
Well cap condition ☑ Good ☐ Locked ☐ Replaced ☐ Needs replacement
Headspace reading ☑ Not measured ____ ppm
Elevation mark ☑ Yes ☐ Added ☐ Other ____
Well diameter ☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other ____
☐ Odor ____ ☐ Comments ____

Purge Data
Total well depth 15.19 ft ☐ Clean bottom ☐ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 6.99 ft
Casing volume 8.20 ft (H_2O) X .16 gpf = 1.31 X 3 = 3.93
Casing volumes 3/4"=0.02 gpf 2"=0.16 gpf 4"=0.65 gpf 6"= 1.47 gpf

Purge Method
Pump type ☑ Peristaltic ☐ Centrifugal ☐ Submersible ☐ Other ____
Purge tubing ☑ New LDPE ☐ New HDPE ☐ New Teflon ☐ New Tygon ☐ Other ____
Bailer type ☐ Disposable ☐ Teflon ☑ Stainless ☐ PVC ☐ Other ____
Purge start time 1557 Purge stop time 1605 Purge rate 0.19 gpm

Field Parameters
Meter used ☐ HYDAC ☐ pH2Tester ☐ Hach ☑ Other hanna

Gallons	pH	Temperature	Conductivity	Comments
2	6.89	54.3	1.55	yellow
3	6.06	61.1	2.02	
4	6.04	62.4	1.97	

Dissolved Oxygen 0.2 ~~Carbon Dioxide~~ ORP -37

Sampling Device
Bailer ☑ Disposable ☐ Stainless ☐ Teflon ☐ Other ____
Filter Type ____ Size ____ (micron) ☐ Other ____
Bailer cord used ☐ Monofillament ☐ Other ____

Bottles Filled Time 1610

Number	Type	Preservative	Filtration
4	☑ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No

Sampler's Signature JWZ Date 11/17/03

GROUNDWATER
SAMPLE COLLECTION FORM

Well ID no MW-3 Project name FIFE
Sample no. MW-3 Project no. 1052
Date 11-17-03 Collector JWZ

Well Information
Monument condition ☑ Good ☐ Needs repair _____
Well cap condition ☑ Good ☐ Locked ☐ Replaced ☐ Needs replacement
Headspace reading ☑ Not measured _____ ppm
Elevation mark ☑ Yes ☐ Added ☐ Other _____
Well diameter ☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other _____
☐ Odor _____ ☐ Comments _____

Purge Data
Total well depth 15.35 ft ☐ Clean bottom ☐ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 7.91 ft
Casing volume 7.44 ft (H_2O) X .16 gpf = 1.19 X 3 = 3.57
Casing volumes 3/4"=0.02 gpf 2"=0.16 gpf 4"=0.65 gpf 6"= 1.47 gpf

Purge Method
Pump type ☑ Peristaltic ☐ Centrifugal ☐ Submersible ☐ Other _____
Purge tubing ☑ New LDPE ☐ New HDPE ☐ New Teflon ☐ New Tygon ☐ Other _____
Bailer type ☐ Disposable ☐ Teflon ☐ Stainless ☐ PVC ☐ Other _____
Purge start time 1619 Purge stop time 1624 Purge rate 1 gpm

Field Parameters
Meter used ☐ HYDAC ☐ pH2Tester ☐ Hach ☑ Other Horiba

Gallons	pH	Temperature	Conductivity	Comments
2	7.04	55.9	1.31	yellow
3	6.90	59.1	1.32	"
4	6.85	60.6	1.29	"

Dissolved Oxygen 0.6 ~~Carbon Dioxide~~ ORP -37

Sampling Device
Bailer ☑ Disposable ☐ Stainless ☐ Teflon ☐ Other _____
Filter Type _____ Size _____ (micron) ☐ Other _____
Bailer cord used ☐ Monofillament ☐ Other _____

Bottles Filled Time 1631

Number	Type	Preservative	Filtration
4	☑ VOA ☐ Amber ☐ Poly	HCL ☑ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No

Sampler's Signature JWZ Date 11/17/03

GROUNDWATER
SAMPLE COLLECTION FORM

Well ID no MW-4 Project name FIFE
Sample no. MW-4 Project no. 1052
Date 11-17-03 Collector JMZ

Well Information
Monument condition ☑ Good ☐ Needs repair
Well cap condition ☑ Good ☐ Locked ☐ Replaced ☐ Needs replacement
Headspace reading ☑ Not measured ____ ppm
Elevation mark ☑ Yes ☐ Added ☐ Other
Well diameter ☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other
☐ Odor ☐ Comments

Purge Data
Total well depth 15.05 ft ☐ Clean bottom ☐ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 7.07 ft
Casing volume 7.98 ft (H_2O) X .16 gpf = 1.27 X 3 = 3.83
Casing volumes 3/4"=0.02 gpf 2"=0.16 gpf 4"=0.65 gpf 6"= 1.47 gpf

Purge Method
Pump type ☑ Peristaltic ☐ Centrifugal ☐ Submersible ☐ Other
Purge tubing ☑ New LDPE ☐ New HDPE ☐ New Teflon ☐ New Tygon ☐ Other
Bailer type ☐ Disposable ☐ Teflon ☐ Stainless ☐ PVC ☐ Other
Purge start time 1510 Purge stop time 1515 Purge rate 3/4 gpm

Field Parameters
Meter used ☐ HYDAC ☐ pH2Tester ☐ Hach ☑ Other Horiba

Gallons	pH	Temperature	Conductivity	Comments
2	6.61	57.8	1.51	yellow
3	6.40	62.1	1.48	"
4	6.38	63.3	1.50	

Dissolved Oxygen 0.7 ~~Carbon Dioxide~~ ORP -39 mv

Sampling Device
Bailer ☑ Disposable ☐ Stainless ☐ Teflon ☐ Other
Filter Type ____ Size ____ (micron) ☐ Other
Bailer cord used ☐ Monofillament ☐ Other

Bottles Filled Time 1320

Number	Type	Preservative	Filtration
4	☑ VOA ☐ Amber ☐ Poly	HCL ☑ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No

Sampler's Signature JMZ Date 11/17/03

GROUNDWATER
SAMPLE COLLECTION FORM

Well ID no MW-5 Project name Fitz
Sample no. MW-5 Project no. 1052
Date 11-17-03 Collector JMZ

Well Information
Monument condition ☑ Good ☐ Needs repair ____
Well cap condition ☑ Good ☐ Locked ☐ Replaced ☐ Needs replacement
Headspace reading ☑ Not measured ____ ppm
Elevation mark ☑ Yes ☐ Added ☐ Other ____
Well diameter ☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other ____
☐ Odor ____ ☐ Comments ____

Purge Data
Total well depth 15.18 ft ☐ Clean bottom ☐ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 5.99 ft
Casing volume 9.19 ft (H_2O) X .16 gpf = 1.47 X 3 = 4.41
Casing volumes 3/4"=0.02 gpf 2"=0.16 gpf 4"=0.65 gpf 6"= 1.47 gpf

Purge Method
Pump type ☑ Peristaltic ☐ Centrifugal ☐ Submersible ☐ Other ____
Purge tubing ☑ New LDPE ☐ New HDPE ☐ New Teflon ☐ New Tygon ☐ Other ____
Bailer type ☐ Disposable ☐ Teflon ☐ Stainless ☐ PVC ☐ Other ____
Purge start time 1426 Purge stop time 1433 Purge rate ≈ 3/4 gpm

Field Parameters
Meter used ☐ HYDAC ☐ pH2Tester ☐ Hach ☑ Other Horiba

Gallons	pH	Temperature	Conductivity	Comments
1+	7.69	57.9	0.69	turbid, brown
2 1/2	8.43	61.1	0.57	"
4	8.25	62.3	0.61	"
4 1/2	8.20	62.9	0.60	" Clear

Dissolved Oxygen 4.6 ~~Carbon Dioxide~~ ORP 83 mV

Sampling Device
Bailer ☑ Disposable ☐ Stainless ☐ Teflon ☐ Other ____
Filter Type ____ Size ____ (micron) ☐ Other ____
Bailer cord used ☐ Monofillament ☐ Other ____

Bottles Filled Time 1444

Number	Type	Preservative	Filtration
4	☑ VOA ☐ Amber ☐ Poly	HCL ☑ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No

Sampler's Signature JMZ Date 11/17/03

GROUNDWATER
SAMPLE COLLECTION FORM

Well ID no MW-6 Project name FIFE
Sample no. MW-6 Project no. 1052
Date 11-17-03 Collector JWS

Well Information
Monument condition ☑ Good ☐ Needs repair _____
Well cap condition ☑ Good ☐ Locked ☐ Replaced ☐ Needs replacement
Headspace reading ☑ Not measured _____ ppm
Elevation mark ☑ Yes ☐ Added ☐ Other _____
Well diameter ☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other _____
☐ Odor _____ ☐ Comments _____

Purge Data
Total well depth 15.08 ft ☐ Clean bottom ☑ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 7.04 ft
Casing volume 8.04 ft (H_2O) X .16 gpf = 1.28 X 3 = 3.85
Casing volumes 3/4"=0.02 gpf 2"=0.16 gpf 4"=0.65 gpf 6"= 1.47 gpf

Purge Method
Pump type ☑ Peristaltic ☐ Centrifugal ☐ Submersible ☐ Other _____
Purge tubing ☑ New LDPE ☐ New HDPE ☐ New Teflon ☐ New Tygon ☐ Other _____
Bailer type ☐ Disposable ☐ Teflon ☐ Stainless ☐ PVC ☐ Other _____
Purge start time 1434 Purge stop time 1459 Purge rate _____

Field Parameters
Meter used ☐ HYDAC ☐ pH2Tester ☐ Hach ☑ Other Horiba

Gallons	pH	Temperature	Conductivity	Comments
1	7.01	56.8	1.74	tubing turb, water yellow
3	6.52	61.3	1.66	yellow
4	6.39	62.9	1.65	
4+	6.35	62.9	1.65	Mem on Purge Water

Dissolved Oxygen — 0.0 ~~Carbon Dioxide~~ ORP -59

Sampling Device
Bailer ☑ Disposable ☐ Stainless ☐ Teflon ☐ Other _____
Filter Type _____ Size _____ (micron) ☐ Other _____
Bailer cord used ☐ Monofillament ☐ Other _____

Bottles Filled Time 1503

Number	Type	Preservative	Filtration
4	☑ VOA ☐ Amber ☐ Poly	HCL ☑ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No

Sampler's Signature JWS Date 11/17/03

ATTACHMENT B

LABORATORY REPORT AND CHAIN-OF-CUSTODY DOCUMENTATION

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

November 24, 2003

Craig Hultgren, Project Manager
PNG Environmental
1339 Commerce Ave., Suite 313
Longview, WA 98632

Dear Mr. Hultgren:

Included are the results from the testing of material submitted on November 18, 2003 from the FIFE-CFN #1052-01, PO 1052-01, F&BI 311158 project. There are 11 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Eric Young
Chemist

Enclosures
PNG1124R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/24/03
Date Received: 11/18/03
Project: FIFE-CFN #1052-01, PO 1052-01, F&BI 311158
Date Extracted: 11/18/03
Date Analyzed: 11/19/03

RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as µg/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 54-146)
MW-1 311158-02	<50	76
MW-2 311158-03	<50	74
MW-3 311158-04	310	79
MW-4 311158-05	<50	79
MW-5 311158-06	<50	60
MW-6 311158-07	<50	54
Method Blank	<50	82

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	TB-111703	Client:	PNG Environmental
Date Received:	11/18/03	Project:	FIFE-CFN #1052-01
Date Extracted:	11/20/03	Lab ID:	311158-01
Date Analyzed:	11/20/03	Data File:	112031.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	91	70	130
1,2-Dichloroethane-d4	95	70	130
Toluene-d8	88	70	130
4-Bromofluorobenzene	88	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<1
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-1	Client:	PNG Environmental
Date Received:	11/18/03	Project:	FIFE-CFN #1052-01
Date Extracted:	11/20/03	Lab ID:	311158-02
Date Analyzed:	11/21/03	Data File:	112032.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	92	70	130
1,2-Dichloroethane-d4	97	70	130
Toluene-d8	88	70	130
4-Bromofluorobenzene	89	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<1
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-2	Client:	PNG Environmental
Date Received:	11/18/03	Project:	FIFE-CFN #1052-01
Date Extracted:	11/20/03	Lab ID:	311158-03
Date Analyzed:	11/21/03	Data File:	112034.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	95	70	130
1,2-Dichloroethane-d4	92	70	130
Toluene-d8	88	70	130
4-Bromofluorobenzene	89	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	1
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<1
o-Xylene	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-3	Client:	PNG Environmental
Date Received:	11/18/03	Project:	FIFE-CFN #1052-01
Date Extracted:	11/20/03	Lab ID:	311158-04
Date Analyzed:	11/21/03	Data File:	112035.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	90	70	130
1,2-Dichloroethane-d4	93	70	130
Toluene-d8	87	70	130
4-Bromofluorobenzene	88	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	130
Benzene	390
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	2
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-4	Client:	PNG Environmental
Date Received:	11/18/03	Project:	FIFE-CFN #1052-01
Date Extracted:	11/20/03	Lab ID:	311158-05
Date Analyzed:	11/21/03	Data File:	112036.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	93	70	130
1,2-Dichloroethane-d4	91	70	130
Toluene-d8	87	70	130
4-Bromofluorobenzene	89	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	140
Benzene	1
Toluene	6
Ethylbenzene	<1
m,p-Xylene	4
o-Xylene	2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-5	Client:	PNG Environmental
Date Received:	11/18/03	Project:	FIFE-CFN #1052-01
Date Extracted:	11/20/03	Lab ID:	311158-06
Date Analyzed:	11/21/03	Data File:	112037.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	95	70	130
1,2-Dichloroethane-d4	93	70	130
Toluene-d8	87	70	130
4-Bromofluorobenzene	90	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<1
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-6	Client:	PNG Environmental
Date Received:	11/18/03	Project:	FIFE-CFN #1052-01
Date Extracted:	11/20/03	Lab ID:	311158-07
Date Analyzed:	11/21/03	Data File:	112038.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	96	70	130
1,2-Dichloroethane-d4	93	70	130
Toluene-d8	88	70	130
4-Bromofluorobenzene	89	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<1
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	Method Blank	Client:	PNG Environmental
Date Received:	11/18/03	Project:	FIFE-CFN #1052-01
Date Extracted:	11/20/03	Lab ID:	03-1250 mb
Date Analyzed:	11/20/03	Data File:	112030.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	88	70	130
1,2-Dichloroethane-d4	96	70	130
Toluene-d8	86	70	130
4-Bromofluorobenzene	86	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<1
o-Xylene	<1

Date of Report: 11/24/03
Date Received: 11/18/03
Project: FIFE-CFN #1052-01, PO 1052-01, F&BI 311158

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Gasoline	µg/L (ppb)	1,000	96	96	49-119	0

Date of Report: 11/24/03
Date Received: 11/18/03
Project: FIFE-CFN #1052-01, PO 1052-01, F&BI 311158

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260B

Laboratory Code: 311158-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methyl t-butyl ether (MTBE)	µg/L (ppb)	<1	<1	nm
Benzene	µg/L (ppb)	<1	<1	nm
Toluene	µg/L (ppb)	<1	<1	nm
Ethylbenzene	µg/L (ppb)	<1	<1	nm
m,p-Xylene	µg/L (ppb)	<1	<1	nm
o-Xylene	µg/L (ppb)	<1	<1	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	µg/L (ppb)	50	106	104	78-109	3
Benzene	µg/L (ppb)	50	103	100	82-118	3
Toluene	µg/L (ppb)	50	105	102	80-113	4
Ethylbenzene	µg/L (ppb)	50	103	100	70-130	3
m,p-Xylene	µg/L (ppb)	50	108	104	70-130	4
o-Xylene	µg/L (ppb)	50	109	105	70-130	4

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

311158

SAMPLE CHAIN OF CUSTODY

EY 11-18-03 V3

Send Report To Craig Hultgren
Company PWG, Environmental
Address 1339 Commerce St
City, State, ZIP Longview, WA
Phone # 360-414-0669 Fax #

SAMPLERS (signature) Jay Grieve
PROJECT NAME/NO. FIFE - CFN #1052-01
PO # 1052-01
REMARKS

Page # 1 of 1

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	BTEX+MTBE by 8260B					Notes
						ANALYSES REQUESTED											BTEX only on TB
TB-111703	01	11-17-03	1244	Water	1							X					~~Hold TB~~
MW-1	02 A-D	"	1543	"	4		X					X					
MW-2	03 A-D	"	1610	"	"		X					X					
MW-3	04 A-D	"	1631	"	"		X					X					
MW-4	05 A-D	"	1520	"	"		X					X					
MW-5	06 A-D	"	1444	"	"		X					X					
MW-6	07 A-D	"	1503	"	"		X					X					

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Jay Grieve	PWG Environmental	11-18-03	1100
Received by:	Brian Braun	F & BI	11-18-03	11:00
Relinquished by:				
Received by:				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

PNG ENVIRONMENTAL, INC.

September 15, 2003 1052-01

Mr. Greg Stewart
Grenley Stewart Resources
1019 Pacific Avenue, 13th Floor
Tacoma, Washington 98402-4443

Subject: **First Post-ORC Injection Quarterly Groundwater Monitoring Report**
Fife Metroplex Card Lock Fuel Sales Facility
3200 20th Street East
Fife, Washington

Dear Mr. Stewart:

This letter presents the results of the first post-ORC injection quarterly groundwater-sampling event at the above referenced site in Fife, Washington. A site features map is presented as Figure 1. The following tasks were performed on August 20, 2003:

- Collection of groundwater level measurements at the six site monitoring wells (MW-1 through MW-6) and the drainage ditch located at the site
- Collection of groundwater samples at the site wells for gasoline range hydrocarbons and benzene, toluene, ethylbenzene, total xylenes, and MTBE analysis
- Preparation of a groundwater elevation contour plot from water level measurements collected on August 20, 2003

GROUNDWATER AND SURFACE WATER CONDITIONS

Water levels were measured prior to sample collection on August 20, 2003. Water level measurements ranged between 6.73 to 8.82 feet below ground surface (bgs) at the site wells and 2.82 feet bgs at the ditch, as summarized on Table 1. PNG prepared a groundwater elevation plot from this data set (Figure 1). Groundwater flow is generally consistent with the May 2003 measurements, showing a southwest direction for most of the site (towards the drainage ditch). A reversal in groundwater direction is shown in the northeastern portion of the site that was not evident in May 2003. The cause for this is currently unknown and may be the result of local mounding of groundwater at this area of the site. PNG will continue to monitor groundwater flow direction at the site to further assess groundwater conditions.

Groundwater Sampling

On August 20, 2003, PNG collected groundwater samples from the six site monitoring wells. Prior to sampling, the cap of each well was removed and the water was allowed to stabilize prior to collecting depth to water measurements. The volume of water in the wells was calculated and approximately three casing volumes of water were purged with a peristaltic pump. A new length of LDPE tubing was used in each well. The water purged from each well was relatively clear with a yellow hue and there was no noticeable sheen

or chemical odor observed during sampling activities. All purge water generated during sampling activities was placed in a 55-gallon drum.

Groundwater samples from the wells were collected with new, disposable polyethylene bailers. Samples were carefully transferred into laboratory-prepared sample containers. The samples were placed in an iced cooler and delivered to Friedman & Bruya Laboratory along with chain-of-custody documentation.

The samples were analyzed for the following constituents:

- Gasoline Range Organics using Northwest Method NWTPH-Gx
- BTEX and MTBE using EPA Method 8260B
- Field parameters: pH, conductivity, and temperature

A summary of depth to water measurements and calculated groundwater and surface water elevations at each location is found in Table 1. Groundwater Sample Collection forms documenting field activities are included in Attachment A.

Analytical Results

Groundwater analytical results indicated that gasoline range organics (up to 680 ug/L), benzene (up to 610 ug/L), and total xylenes (up to 3 ug/L) were detected in monitoring wells MW-3 and MW-4. MTBE (up to 170 ug/L) was detected in monitoring wells MW-2 through MW-4. The highest concentration of each chemical in groundwater is found at MW-3. The dissolved oxygen concentrations ranged from 0.1 to 2.1 parts per million (ppm), with the highest concentrations found at MW-3 and MW-4. The field parameters are documented on the Groundwater Sample Collection forms found in Attachment A. A summary of the analytical results is presented on Table 2 with full volatile organics constituents for wells MW-3 and MW-4 presented in Table 3. A copy of the laboratory report is included in Attachment B.

DISCUSSION

Based on calculated groundwater elevation measurements in May and August 2003, the direction of groundwater flow at the site is generally to the southwest towards the drainage ditch. The cause of the observed reversal in groundwater flow in the northeastern portion of the site during this sampling event (August 2003) is currently unknown. Monitoring well MW-5 is on the downgradient side of the UST nest and there has been no detection of analytes in the well during the past two sampling events. PNG will be able to better characterize groundwater flow patterns at the site with the routine collection of site data.

Analytical results of the first post-ORC injection-sampling event showed a general decrease in benzene as compared to the sampling event performed immediately before ORC injection on May 20, 2003. However, the benzene concentration pattern correlates with the seasonal fluctuation in water levels as higher water levels relate to higher benzene concentrations. MTBE concentrations were at similar concentrations or slightly higher compared to the previous sampling event. PNG will continue to monitor groundwater conditions at the site to see if the trend towards improving groundwater quality develops.

PNG appreciates the opportunity to assist you on this project. Please call (360) 414-0669 if you have any questions or comments.

Sincerely,

PNG ENVIRONMENTAL, INC.

Craig Hultgren, R.G.
Project Manager

Paul McBeth, R.G.
President

Attachments: Table 1 - Groundwater Levels and Elevation
Table 2 - Summary of Groundwater Analytical Results
Figure 1- Site Map
Attachment A - Groundwater Collection Sampling Forms
Attachment B - Laboratory Report and Chain-of-Custody Documentation

cc: Ms. Beth Muhler, IUM

Table 1
Depth to Water Measurements
Card Lock Fuel Sales Facility
Fife, Washington

Depth to Water

Well	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	Ditch
Casing Elevation[a]	12.01	12.48	13.65	12.87	11.62	12.90	7.50
10/10/02[b]	9.05	9.24	10.44	9.48	8.75	9.50	NM
01/09/03[b]	6.22	6.83	7.88	6.91	5.51	6.78	NM
05/20/03	6.49	7.10	8.15	7.18	5.90	7.16	2.30
08/20/03	7.11	7.74	8.82	7.84	6.73	7.88	2.82

Groundwater Elevation

Well	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	Ditch
Casing Elevation[a]	12.01	12.48	13.65	12.87	11.62	12.90	7.50
10/10/02[b]	2.96	3.24	3.21	3.39	2.87	3.40	NM
01/09/03[b]	5.79	5.65	5.77	5.96	6.11	6.12	NM
05/20/03	5.52	5.38	5.50	5.69	5.72	5.74	5.20
08/20/03	4.90	4.74	4.83	5.03	4.89	5.02	4.68

Notes:
[a] Elevations are relative to a City of Tacoma control point in NE 20th Street
The elevation of the control point is relative the NGVD29 vertical datum
[b] Measurements collected by Saltbush Environmental Services, Inc.
NM = Not measured

Table 2
Summary of Groundwater Analytical Results - (ug/L)
Card Lock Fuels Sales Facility
Fife, Washington

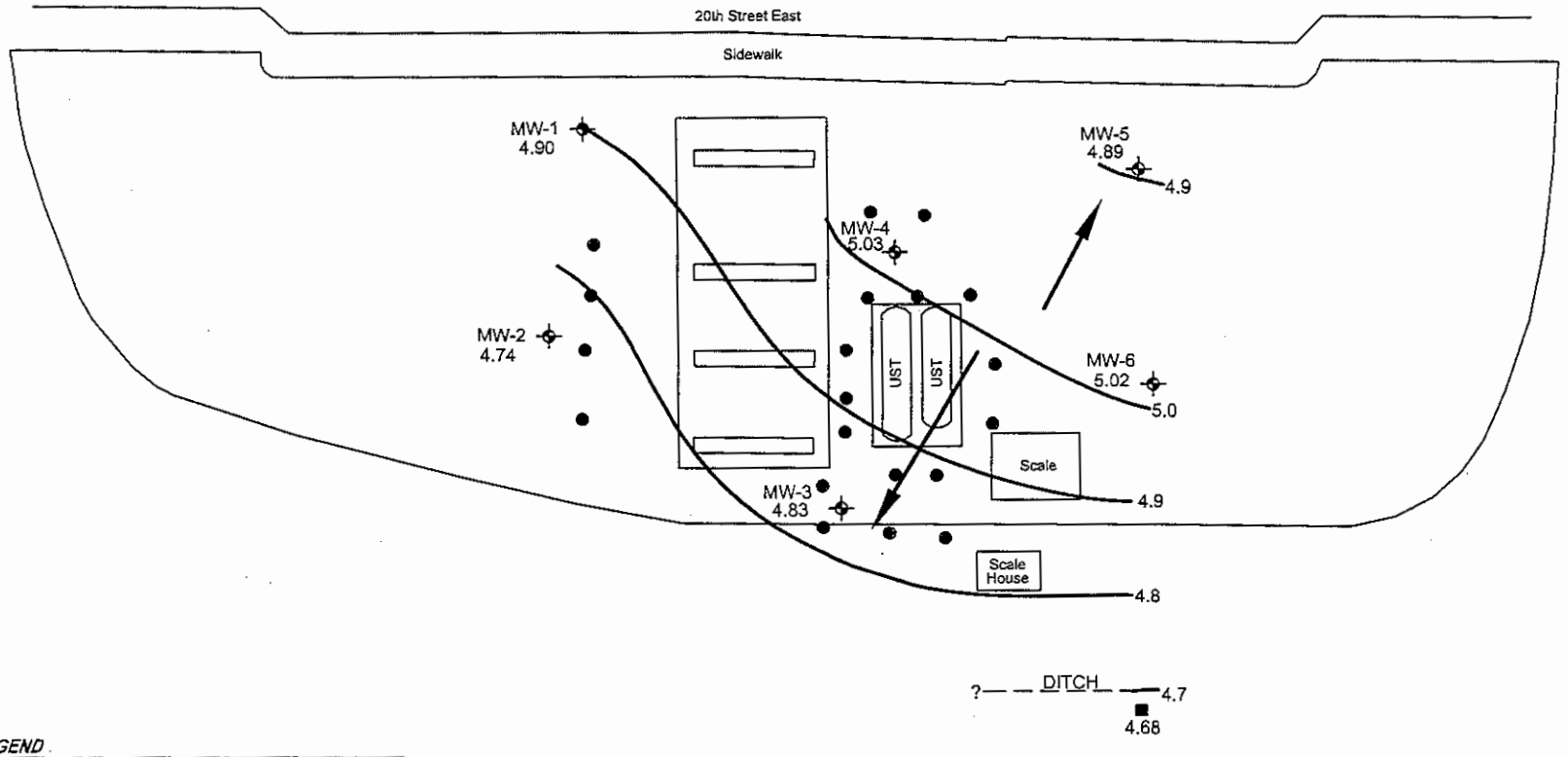
Sample Identification	MW-1				MW-2				MW-3				Cleanup Standard[a]
Date Sampled	10/10/02	01/09/03	05/20/03	08/20/03	10/10/02	01/09/03	05/20/03	08/20/03	10/10/02	01/09/03	05/20/03	08/20/03	
Parameters													
Gasoline Range Organics	100 U	ND	NA	250 U	100 U	ND	NA	250 U	1,300	3,900	1,600	680	800
Benzene	1 U	ND	NA	1 U	1 U	ND	NA	1 U	360	2,900	700	610	5
Toluene	1 U	2.4	NA	1 U	1 U	ND	NA	1 U	1 U	1.1	10 U	1 U	1,000
Ethylbenzene	1 U	ND	NA	1 U	1 U	ND	NA	1 U	1 U	ND	10 U	1 U	700
Total Xylenes	1 U	4.3	NA	2 U	1 U	ND	NA	2 U	42	5.4	20 U	3	1,000
Methyl t-butyl ether (MTBE)	1 U	ND	NA	1 U	1 U	32	NA	1	1 U	140	160	170	20

Notes:
[a] MTCA Method A Cleanup Standard (Cleanup Standard)
ug/L = Micrograms per liter
U = Undetected at method limit shown
ND = Not detected
NA = Not analyzed
The analytical results that are in bold exceed the referenced Cleanup Standard
Gasoline range hydrocarbons by NWTPH-Gx
BTEX and MTBE by EPA Method 8260B

Table 2
Summary of Groundwater Analytical Results - (ug/L)
Card Lock Fuels Sales Facility
Fife, Washington

Sample Identification	MW-4				MW-5				MW-6				Cleanup Standard[a]
Date Sampled	10/10/02	01/09/03	05/20/03	08/20/03	10/10/02	01/09/03	05/20/03	08/20/03	10/10/02	01/09/03	05/20/03	08/20/03	
Parameters													
Gasoline Range Organics	100 U	ND	50 U	250 U	100 U	ND	NA	250 U	100 U	ND	NA	250 U	800
Benzene	14	33	11	4	1 U	ND	NA	1 U	1 U	ND	NA	1 U	5
Toluene	1 U	ND	1 U	1 U	1 U	ND	NA	1 U	1 U	ND	NA	1 U	1,000
Ethylbenzene	1 U	ND	1 U	1 U	1 U	ND	NA	1 U	1 U	ND	NA	1 U	700
Total Xylenes	2	ND	2 U	2 U	1 U	ND	NA	2 U	1 U	ND	NA	2 U	1,000
Methyl t-butyl ether (MTBE)	1 U	160	130	140	1 U	ND	NA	1 U	1 U	ND	NA	1 U	20

Notes:
[a] MTCA Method A Cleanup S
ug/L = Micrograms per liter
U = Undetected at method lir
ND = Not detected
NA = Not analyzed
The analytical results that are
Gasoline range hydrocarbons
BTEX and MTBE by EPA Me



LEGEND

- MW-1 ⊕ MONITORING WELL
- ● INJECTION POINT
- GROUNDWATER ELEVATION CONTOUR
- 5.52 GROUNDWATER ELEVATION
- PUMP ISLAND
- GROUNDWATER FLOW DIRECTION
- ■ DITCH

NOTE:
BASE MAP FROM BLUHM & ASSOCIATES
LAND SURVEYORS, INC. JUNE 13, 2003.

APPROXIMATE SCALE IN FEET

0 20 40 80

N

PNG ENVIRONMENTAL INC.
1339 Commerce Avenue, Suite 313
Longview, Washington 98632
TEL (360) 414-0669
FAX (360) 414-0663

DATE: 9/8/03
FILE NAME: 105201-BASE
DRAWN BY: AA
APPROVED BY: CH

FIFE CARDLOCK FUEL FACILITY
FIFE, WASHINGTON

GROUNDWATER ELEVATION CONTOUR
AUGUST 20, 2003

Project No. 1052-01
Figure No. 1

ATTACHMENT A
GROUNDWATER SAMPLE COLLECTION FORMS

GROUNDWATER SAMPLE COLLECTION FORM

Well ID no. MW-1 Project name FKF
Sample no. MW-1 Project no. 1034
Date 8-20-03 Collector JMZ

Well Information
Monument condition ☑ Good ☐ Needs repair
Well cap condition ☑ Good ☐ Locked ☐ Replaced ☐ Needs replacement
Headspace reading ☑ Not measured ____ ppm
Elevation mark ☑ Yes ☐ Added ☐ Other
Well diameter ☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other
☐ Odor ☐ Comments

Purge Data
Total well depth 15.30 ft ☐ Clean bottom ☐ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 7.11 ft
Casing volume 8.19 ft (H_2O) X .16 gpf = 1.31 X 3 = 3.93
Casing volumes 3/4"=0.02 gpf 2"=0.16 gpf 4"=0.65 gpf 6"= 1.47 gpf

Purge Method
Pump type ☑ Peristaltic ☐ Centrifugal ☐ Submersible ☐ Other
Purge tubing ☐ New LDPE ☑ New HDPE ☐ New Teflon ☐ New Tygon ☐ Other
Bailer type ☐ Disposable ☐ Teflon ☐ Stainless ☐ PVC ☐ Other
Purge start time 1003 Purge stop time 1006 Purge rate 1 gpm

Field Parameters
Meter used ☐ HYDAC ☐ pH2Tester ☐ Hach ☐ Other

Gallons	pH	Temperature	Conductivity	Comments
2	6.33	68.3	1.91	yellow-clear
3	6.46	66.6	2.17	"
4	6.62	68.2	2.08	"

Slight cloudy stream of yellow purge water

Dissolved Oxygen Ref Carbon Dioxide

Sampling Device
Bailer ☑ Disposable ☐ Stainless ☐ Teflon ☐ Other
Filter Type ____ Size ____ (micron) ☐ Other
Bailer cord used ☐ Monofillament ☐ Other

Bottles Filled Time 1011

Number	Type	Preservative	Filtration
4	☑ VOA ☐ Amber ☐ Poly	HCL ☑ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No

Sampler's Signature JMZ Date 8/20/03

GROUNDWATER
SAMPLE COLLECTION FORM

Well ID no MW-3 Project name Fife
Sample no. MW-3 Project no. 1034
Date 5-30-03 Collector JJ

Well Information
Monument condition ☒ Good ☐ Needs repair
Well cap condition ☒ Good ☐ Locked ☐ Replaced ☐ Needs replacement
Headspace reading ☒ Not measured ____ ppm
Elevation mark ☒ Yes ☐ Added ☐ Other
Well diameter ☒ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other
☐ Odor ☐ Comments

Purge Data
Total well depth 15.19 ft ☐ Clean bottom ☐ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 7.74 ft
Casing volume 7.45 ft (H_2O) X .16 gpf = 1.19 X 3 = 3.57
Casing volumes 3/4"=0.02 gpf 2"=0.16 gpf 4"=0.65 gpf 6"= 1.47 gpf

Purge Method
Pump type ☒ Peristaltic ☐ Centrifugal ☐ Submersible ☐ Other
Purge tubing ☐ New LDPE ☒ New HDPE ☐ New Teflon ☐ New Tygon ☐ Other
Bailer type ☐ Disposable ☐ Teflon ☐ Stainless ☐ PVC ☐ Other
Purge start time 1133 Purge stop time 1137 Purge rate 1 gpm

Field Parameters
Meter used ☐ HYDAC ☐ pH2Tester ☐ Hach ☐ Other

Gallons	pH	Temperature	Conductivity	Comments
1	6.46	65.1	1.93	Clear yellow
2	6.56	67.9	2.00	"
4	6.66	68.0	1.96	"

Dissolved Oxygen 1.1 Carbon Dioxide Slight green purple

Sampling Device
Bailer ☒ Disposable ☐ Stainless ☐ Teflon ☐ Other
Filter Type ____ Size ____ (micron) ☐ Other
Bailer cord used ☐ Monofillament ☐ Other

Bottles Filled Time 1144

Number	Type	Preservative	Filtration
4	☒ VOA ☐ Amber ☐ Poly	HCL ☒ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No

Sampler's Signature JJ Date 5/30/03

GROUNDWATER
SAMPLE COLLECTION FORM

Well ID no MW-3 Project name FIRE
Sample no. MW-3 Project no. 1034
Date 8-20-03 Collector JH

Well Information
Monument condition ☑ Good ☐ Needs repair ____
Well cap condition ☑ Good ☐ Locked ☐ Replaced ☐ Needs replacement
Headspace reading ☑ Not measured ____ ppm
Elevation mark ☑ Yes ☐ Added ☐ Other ____
Well diameter ☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other ____
☐ Odor ____ ☐ Comments ____

Purge Data
Total well depth 15.35 ft ☐ Clean bottom ☐ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 8.82 ft
Casing volume 6.53 ft (H_2O) X .16 gpf = 1.04 X 3 = 3.13
Casing volumes 3/4"=0.02 gpf 2"=0.16 gpf 4"=0.65 gpf 6"= 1.47 gpf

Purge Method
Pump type ☑ Peristaltic ☐ Centrifugal ☐ Submersible ☐ Other ____
Purge tubing ☐ New LDPE ☑ New HDPE ☐ New Teflon ☐ New Tygon ☐ Other ____
Bailer type ☐ Disposable ☐ Teflon ☐ Stainless ☐ PVC ☐ Other ____
Purge start time 1153 Purge stop time 1157 Purge rate 1 gpm

Field Parameters
Meter used ☐ HYDAC ☐ pH2Tester ☐ Hach ☐ Other ____

Gallons	pH	Temperature	Conductivity	Comments
1	6.42	71.8	1.41	Clear, yellow
2	6.48	66.7	1.37	" "
3+	6.60	Rec'l	1.32	" "

Dissolved Oxygen 2.1 Carbon Dioxide ____

Sampling Device
Bailer ☑ Disposable ☐ Stainless ☐ Teflon ☐ Other ____
Filter Type ____ Size ____ (micron) ☐ Other ____
Bailer cord used ☐ Monofillament ☐ Other ____

Bottles Filled Time 1306

Number	Type	Preservative	Filtration
4	☑ VOA ☐ Amber ☐ Poly	HCL ☑ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No

Sampler's Signature JH Date 8/20/03

GROUNDWATER
SAMPLE COLLECTION FORM

Well ID no MW-4 Project name FIFE
Sample no. MW-4 Project no. 1034
Date 8-20-03 Collector JMZ

Well Information
Monument condition ☑ Good ☐ Needs repair ____
Well cap condition ☑ Good ☐ Locked ☐ Replaced ☐ Needs replacement
Headspace reading ☑ Not measured ____ ppm
Elevation mark ☑ Yes ☐ Added ☐ Other ____
Well diameter ☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other ____
☐ Odor ____ ☐ Comments ____

Purge Data
Total well depth 15.05 ft ☐ Clean bottom ☐ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 7.64 ft
Casing volume 7.41 ft (H_2O) X .16 gpf = 1.15 X 3 = 3.46
Casing volumes 3/4"=0.02 gpf 2"=0.16 gpf 4"=0.65 gpf 6"= 1.47 gpf

Purge Method
Pump type ☑ Peristaltic ☐ Centrifugal ☐ Submersible ☐ Other ____
Purge tubing ☐ New LDPE ☑ New HDPE ☐ New Teflon ☐ New Tygon ☐ Other ____
Bailer type ☐ Disposable ☐ Teflon ☐ Stainless ☐ PVC ☐ Other ____
Purge start time 1111 Purge stop time 1116 Purge rate 1gpm

Field Parameters
Meter used ☐ HYDAC ☐ pH2Tester ☐ Hach ☐ Other ____

Gallons	pH	Temperature	Conductivity	Comments
1	6.35	68.6	1.44	Clear, yellow
2	6.39	68.1	1.64	" "
3 1/2+	6.46	66.8	1.67	Slight sheen

Dissolved Oxygen 1.4 Carbon Dioxide ____

Sampling Device
Bailer ☑ Disposable ☐ Stainless ☐ Teflon ☐ Other ____
Filter Type ____ Size ____ (micron) ☐ Other ____
Bailer cord used ☐ Monofillament ☐ Other ____

Bottles Filled Time 1122

Number	Type	Preservative	Filtration
4	☐ VOA ☐ Amber ☐ Poly	HCL ☑ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other ____	☐ Yes ☐ No

Sampler's Signature JMZ Date 8/20/03

GROUNDWATER
SAMPLE COLLECTION FORM

Well ID no MW 5 Project name PIES
Sample no. MW 5 Project no. 1034
Date 8-20-03 Collector JWL

Well Information
Monument condition ☑ Good ☐ Needs repair
Well cap condition ☑ Good ☐ Locked ☐ Replaced ☐ Needs replacement
Headspace reading ☑ Not measured ____ ppm
Elevation mark ☑ Yes ☐ Added ☐ Other
Well diameter ☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other
☐ Odor ☐ Comments

Purge Data
Total well depth 15.18 ft ☐ Clean bottom ☐ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 6.73 ft
Casing volume 8.45 ft (H_2O) X .16 gpf = 1.35 X 3 = 4.05
Casing volumes 3/4"=0.02 gpf 2"=0.16 gpf 4"=0.65 gpf 6"= 1.47 gpf

Purge Method
Pump type ☑ Peristaltic ☐ Centrifugal ☐ Submersible ☐ Other
Purge tubing ☐ New LDPE ☑ New HDPE ☐ New Teflon ☐ New Tygon ☐ Other
Bailer type ☐ Disposable ☐ Teflon ☐ Stainless ☐ PVC ☐ Other
Purge start time 933 Purge stop time 939 Purge rate 1 gpm

Field Parameters
Meter used ☐ HYDAC ☐ pH2Tester ☐ Hach ☐ Other

Gallons	pH	Temperature	Conductivity	Comments
1	6.54	70.1	1.69	Turbid to Tan
2	6.37	67.7	1.63	Clear, slight yellow
4+	6.54	66.6	1.44	" "

Cloudy slight odor on yellow purge water.
Dissolved Oxygen 1.2 Carbon Dioxide ____

Sampling Device
Bailer ☑ Disposable ☐ Stainless ☐ Teflon ☐ Other
Filter Type ____ Size ____ (micron) ☐ Other
Bailer cord used ☐ Monofilament ☐ Other

Bottles Filled Time 938

Number	Type	Preservative	Filtration
4	☑ VOA ☐ Amber ☐ Poly	HCL ☑ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
____	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No

Sampler's Signature JWL Date 8/20/03

GROUNDWATER
SAMPLE COLLECTION FORM

Well ID no MW-6 Project name FIFE
Sample no. MW-6 Project no. 1034
Date 8-20-03 Collector JMS

Well Information
Monument condition ☑ Good ☐ Needs repair
Well cap condition ☑ Good ☐ Locked ☐ Replaced ☐ Needs replacement
Headspace reading ☑ Not measured ____ ppm
Elevation mark ☑ Yes ☐ Added ☐ Other
Well diameter ☑ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other
☐ Odor ☐ Comments

Purge Data
Total well depth 15.08 ft ☐ Clean bottom ☐ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 7.85 ft
Casing volume 7.2 ft (H_2O) X .16 gpf = 1.15 X 3 = 3.45
Casing volumes 3/4"=0.02 gpf 2"=0.16 gpf 4"=0.65 gpf 6"= 1.47 gpf

Purge Method
Pump type ☑ Peristaltic ☐ Centrifugal ☐ Submersible ☐ Other
Purge tubing ☐ New LDPE ☐ New HDPE ☐ New Teflon ☐ New Tygon ☐ Other
Bailer type ☐ Disposable ☐ Teflon ☐ Stainless ☐ PVC ☐ Other
Purge start time 945 Purge stop time 949 Purge rate 1gpm

Field Parameters
Meter used ☐ HYDAC ☐ pH2Tester ☐ Hach ☐ Other

Gallons	pH	Temperature	Conductivity	Comments
1	6.36	66.2	1.65	yellow/clear
2	6.93	67.7	1.64	"
3/2+	6.90	67.8	1.42	"

slight cloudy salmon yellowish Brine water

Dissolved Oxygen 10.5 Carbon Dioxide

Sampling Device
Bailer ☑ Disposable ☐ Stainless ☐ Teflon ☐ Other
Filter Type Size (micron) ☐ Other
Bailer cord used ☐ Monofillament ☐ Other

Bottles Filled Time 954

Number	Type	Preservative	Filtration
4	☐ VOA ☐ Amber ☐ Poly	HCL ☑ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
	☐ VOA ☐ Amber ☐ Poly	HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No

Sampler's Signature JMS Date 8/20/03

ATTACHMENT B

LABORATORY REPORT AND CHAIN-OF-CUSTODY DOCUMENTATION

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
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3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
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e-mail: fbi@isomedia.com

August 28, 2003

Craig Hultgren, Project Manager
PNG Environmental
1339 Commerce Ave., Suite 313
Longview, WA 98632

Dear Mr. Hultgren:

Included are the results from the testing of material submitted on August 20, 2003 from the FIFE CFN, PO 1034-01, F&BI 308220 project. There are 12 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Eric Young
Chemist

Enclosures
PNG0828R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/28/03
Date Received: 08/20/03
Project: FIFE CFN, PO 1034-01, F&BI 308220
Date Extracted: 08/21/03
Date Analyzed: 08/22/03

RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as µg/L (ppb)

Sample ID Laboratory ID	Gasoline Range (C_6-C_{10})	Surrogate (% Recovery) (Limit 65-135)
MW-1 d 308220-02	<250	81
MW-2 d 308220-03	<250	81
MW-3 d 308220-04	680	76
MW-4 d 308220-05	<250	75
MW-5 d 308220-06	<250	72
MW-6 d 308220-07	<250	77
Method Blank	<50	86

d - The sample was diluted due to matrix effect (foamy). Detection limits are raised due to dilution.

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	TB82003	Client:	PNG Environmental
Date Received:	08/20/03	Project:	FIFE CFN, PO 1034-01, F&BI 308220
Date Extracted:	08/26/03	Lab ID:	308220-01
Date Analyzed:	08/26/03	Data File:	082539.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	93	70	130
1,2-Dichloroethane-d4	102	70	130
Toluene-d8	98	70	130
4-Bromofluorobenzene	98	70	130

Compounds:	Concentration ug/L (ppb)
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<1
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-1	Client:	PNG Environmental
Date Received:	08/20/03	Project:	FIFE CFN, PO 1034-01, F&BI 308220
Date Extracted:	08/26/03	Lab ID:	308220-02
Date Analyzed:	08/26/03	Data File:	082545.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	95	70	130
1,2-Dichloroethane-d4	102	70	130
Toluene-d8	98	70	130
4-Bromofluorobenzene	99	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<1
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-2	Client:	PNG Environmental
Date Received:	08/20/03	Project:	FIFE CFN, PO 1034-01, F&BI 308220
Date Extracted:	08/26/03	Lab ID:	308220-03
Date Analyzed:	08/26/03	Data File:	082546.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	97	70	130
1,2-Dichloroethane-d4	100	70	130
Toluene-d8	98	70	130
4-Bromofluorobenzene	98	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	1
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<1
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-3	Client:	PNG Environmental
Date Received:	08/20/03	Project:	FIFE CFN, PO 1034-01, F&BI 308220
Date Extracted:	08/26/03	Lab ID:	308220-04
Date Analyzed:	08/26/03	Data File:	082547.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	95	70	130
1,2-Dichloroethane-d4	97	70	130
Toluene-d8	98	70	130
4-Bromofluorobenzene	96	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	170
Benzene	630 ve
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	3
o-Xylene	<1

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration is an estimate.

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-3	Client:	PNG Environmental
Date Received:	08/20/03	Project:	FIFE CFN, PO 1034-01, F&BI 308220
Date Extracted:	08/26/03	Lab ID:	308220-04 1/10
Date Analyzed:	08/26/03	Data File:	082614.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	101	70	130
1,2-Dichloroethane-d4	99	70	130
Toluene-d8	99	70	130
4-Bromofluorobenzene	99	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	170
Benzene	610
Toluene	<10
Ethylbenzene	<10
m,p-Xylene	<10
o-Xylene	<10

Note: The sample was diluted due to the presence of high levels of material. Detection limits are raised due to dilution.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-4	Client:	PNG Environmental
Date Received:	08/20/03	Project:	FIFE CFN, PO 1034-01, F&BI 308220
Date Extracted:	08/26/03	Lab ID:	308220-05
Date Analyzed:	08/26/03	Data File:	082542.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	95	70	130
1,2-Dichloroethane-d4	100	70	130
Toluene-d8	98	70	130
4-Bromofluorobenzene	100	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	140
Benzene	4
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<1
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-5	Client:	PNG Environmental
Date Received:	08/20/03	Project:	FIFE CFN, PO 1034-01, F&BI 308220
Date Extracted:	08/26/03	Lab ID:	308220-06
Date Analyzed:	08/26/03	Data File:	082543.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	95	70	130
1,2-Dichloroethane-d4	100	70	130
Toluene-d8	98	70	130
4-Bromofluorobenzene	98	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<1
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-6	Client:	PNG Environmental
Date Received:	08/20/03	Project:	FIFE CFN, PO 1034-01, F&BI 308220
Date Extracted:	08/26/03	Lab ID:	308220-07
Date Analyzed:	08/26/03	Data File:	082544.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	94	70	130
1,2-Dichloroethane-d4	98	70	130
Toluene-d8	98	70	130
4-Bromofluorobenzene	100	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<1
o-Xylene	<1

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	Method Blank	Client:	PNG Environmental
Date Received:	Not Applicable	Project:	FIFE CFN, PO 1034-01, F&BI 308220
Date Extracted:	08/25/03	Lab ID:	03-910 mb
Date Analyzed:	08/26/03	Data File:	082538.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	93	70	130
1,2-Dichloroethane-d4	102	70	130
Toluene-d8	99	70	130
4-Bromofluorobenzene	99	70	130

Compounds:	Concentration ug/L (ppb)
Methyl t-butyl ether (MTBE)	<1
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<1
o-Xylene	<1

Date of Report: 08/28/03
Date Received: 08/20/03
Project: FIFE CFN, PO 1034-01, F&BI 308220

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 308221-04 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Gasoline	µg/L (ppb)	<50	<50	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Gasoline	µg/L (ppb)	1,000	95	89	62-120	7

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

Date of Report: 08/28/03
Date Received: 08/20/03
Project: FIFE CFN, PO 1034-01, F&BI 308220

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260B

Laboratory Code: 308221-06 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methyl t-butyl ether (MTBE)	µg/L (ppb)	<1	<1	nm
Benzene	µg/L (ppb)	<1	<1	nm
Toluene	µg/L (ppb)	<1	<1	nm
Ethylbenzene	µg/L (ppb)	<1	<1	nm
m,p-Xylene	µg/L (ppb)	<1	<1	nm
o-Xylene	µg/L (ppb)	<1	<1	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Methyl t-butyl ether (MTBE)	µg/L (ppb)	50	107	106	70-130	1
Benzene	µg/L (ppb)	50	104	105	70-130	1
Toluene	µg/L (ppb)	50	101	101	70-130	0
Ethylbenzene	µg/L (ppb)	50	103	103	70-130	0
m-Xylene	µg/L (ppb)	50	106	106	70-130	0
o-Xylene	µg/L (ppb)	50	108	108	70-130	0

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

308220

SAMPLE CHAIN OF CUSTODY

E.Y 08/20/03

V3

Page # 1 of 1

Send Report To: Craig Hultgren

Company: PNG Environmental

Address: 1339 Commerce Ave, Suite 308

City, State ZIP: Longview, WA 98632

Phone # (360) 414-0569 Fax # (360) 414-0663

SAMPLERS (signature): [signature]

PROJECT NAME/NO.: FIFE CFU

PO #: 1034-01

REMARKS: NWTPH-Dx/BTEX/MTBE

TURNAROUND TIME
- ☒ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	NWTPH-Dx/BTEX/MTBE						Notes
TB 82003	01 A-B	8/20/03	0730	Water	2							X						BTEX only
MW-1	02 A-D		1611		4							X						
MW-2	03 A-D		1144									X						
MW-3	04 A-D		1206									X						
MW-4	05 A-D		1122									X						
MW-5	06 A-D		0938									X						
MW-6	07 A-D		0954									X						

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	[signature]	Craig Hultgren	PNG	8-20-03	1350
Received by:	[signature]	Erin Upton	FBI	8/20/03	1350
Relinquished by:					
Received by:					