July 2, 2003 1052-01

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

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

Dear Mr. Stewart:

This letter describes the results of the first groundwater sampling event and the implementation of remedial action (injection of oxygen release compounds (ORC)) at the above referenced site (Figure 1). This work was conducted under Washington State Department of Ecology (Ecology) Underground Injection Control (UIC) registration number 20075.

The scope of work included:

- Collecting depth to water measurements at the six site monitoring wells.
- Injecting 720 gallons of oxygen release compounds (ORC) in to 20 injection borings utilizing the Geoprobe method.
- Collecting groundwater samples from two site monitoring wells (MW-3 and MW-4) prior to ORC injection.
- Direction of site surveying by a professional survey contractor.

UNDERGROUND UTILITY LOCATE SERVICES

An underground utility locating survey was provided by Locates Down Under (LDU) prior to the commencement of drilling and ORC injection activities. LDU cleared the monitoring well locations and painted the location of all identified underground utilities on top of the asphalt south and east of the site building to assist in the placement of ORC injection probes.

Prior to drilling, each injection boring was excavated by vacuum down to 5 feet below ground surface (bgs) by Emerald Services, Inc. (Emerald). This was done as a precautionary measure to identify/avoid subsurface product and/or underground utility lines. The asphalt or concrete surface was cored and a 10-inch diameter pilot hole was advanced by vacuum using a vacuum truck provided by Emerald. The excavated soil was temporarily stored in the vacuum truck and was disposed of at the end of the job. A total of 3.23 tons of soil was taken to TPS Technology's facility in Tacoma, Washington for treatment by incineration prior to disposal. A copy of the soil disposal manifest is included in Attachment A.

Surveying

Bluhm and Associates (Bluhm) of Chehalis, Washington performed professional survey services at the site. Bluhm surveyed the location and elevation (top of the 2-inch PVC casing) of monitoring wells MW-1 through MW-6, the north side of the metal culvert (Ditch) placed in the drainage ditch located south of the site, and the location of the ORC injection points. These site features were added to the site base map (Figure 2). The elevations of the top of the PVC casings at the permanently inscribed mark (Table 3) will be used for calculating groundwater elevations at each respective monitoring well.

INJECTION OF OXYGEN RELEASE COMPOUNDS

On May 20-22, 2003, a total of 720 gallons of ORC in the form of magnesium peroxide, magnesium oxide, and magnesium hydroxide (manufactured by Regenisis) was injected into 20 injection points around the site. A total of sixteen injection points were drilled around the USTs and four borings were drilled west of the pump islands. The ORC injection points are shown on Figure 2.

The injection equipment consisted of clean stainless steel 1.5-inch diameter Geoprobe direct-push drilling and sampling tools. Each injection point was driven to a maximum depth of 20 feet bgs using 5-foot long Geoprobe rods. ORC was pumped in to the formation using a grout pump as the rods were lifted from the ground. Approximately 36 gallons of ORC was injected in to each boring from 4 to 20 feet bgs. At the completion of each injection point, the borehole was sealed with granular bentonite and capped with an asphalt patch (in the asphalt-covered areas) or concrete.

GROUNDWATER CONDITIONS

Water levels were measured prior to sample collection on May 20, 2003. Groundwater measurements in the site wells and drainage ditch ranged between 2.30 to 8.15 feet bgs, as summarized on Table 1. Groundwater flow is towards the southwest with a gradient of approximately 0.004 feet per foot (ft/ft). A plot of groundwater elevation contours for May 20, 2003 is shown on Figure 2.

Groundwater Sampling

On May 20, 2003, PNG collected groundwater samples from the two monitoring wells located next to the USTs at the site (MW-3 and MW-4). This sampling event represents the pre-ORC injection monitoring as described in the proposal dated May 9, 2003. 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 that were sampled was calculated and water was purged with a peristaltic pump. A minimum of three casing volumes of water was removed from the wells prior to sample collection. A new length of LDPE tubing was used in each well. The water purged from each well was relatively clear 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 and Bruya Laboratory (Friedman) and were accompanied by chain-of-custody documentation. *Groundwater Sample Collection Forms* documenting field activities are included in Attachment B. A copy of the laboratory report and chain-of-custody for this sampling event is included in Attachment C.

The samples were analyzed for the following constituents:

- Gasoline range organics using Method NWTPH-Gx.
- Volatile organic compounds using EPA Method 8260B.
- Field parameters: pH, conductivity, temperature, and dissolved oxygen.

Analytical Results

Gasoline range organics (Table 2): Gasoline range organics was detected in the MW-3 sample at a concentration of 1,600 ug/L.

VOCs (Table 3): Benzene (up to 700 ug/L) and MTBE (up to 160 ug/L) were detected in both wells with the highest concentration found in MW-3. 1,2,4-Trimethylbenzene was detected in the MW-3 sample at a concentration of 43 ug/L.

Dissolved oxygen (Groundwater Sample Collection Form): Dissolved oxygen levels in the two wells sampled ranged between 1.7 to 3.1 parts per million (ppm).

DISCUSSION

Results of the groundwater sampling indicated that the MTCA Method A Cleanup Standard for benzene (5 ug/L) and MTBE (20 ug/L) were exceeded in monitoring wells MW-3 and MW-4. PNG directed the injection of 720 pounds of ORC in to 20 injection points near the USTs and pump island in an effort to increase the available oxygen content in the subsurface environment. It is anticipated that increased oxygen content in the subsurface will stimulate the biodegradation of contaminants in groundwater at the site.

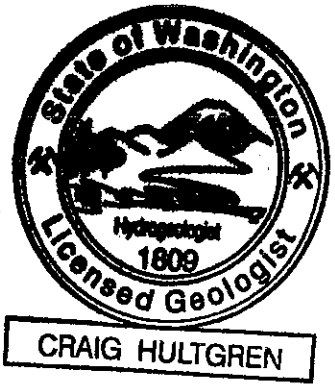
PNG will conduct quarterly groundwater monitoring to assess remediation progress over time. The first sampling event is tentatively scheduled for August 2003. PNG appreciates the opportunity to assist you on this project. Please call (360) 414-0669 if you have any questions or comments.

Sincerely,

PNG ENVIRONMENTAL, INC.

Craig Hultgren, R.G.
Project Manager

John Kuhlman, R.G.
Vice President



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

Cc: Ms. Beth Muhler

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

Depth to Groundwater

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
5/20/2003	6.49	7.10	8.15	7.18	5.90	7.16	2.30

Groundwater 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
5/20/2003	5.52	5.38	5.50	5.69	5.72	5.74	5.20

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

Table 2
Groundwater Analytical Results - Gasoline Range Organics (ug/L)
Card Lock Fuels Sales Facility
Fife, Washington

Sample Identification	Date Sampled	Gasoline Range Organics
Cleanup Standard[1]		**800**
MW-1	NA	NA
MW-2	NA	NA
MW-3	05/20/03	**1,600**
MW-4	05/20/03	50 U
MW-5	NA	NA
MW-6	NA	NA

Notes:
ug/L = Micrograms per liter
U = Undetected at method limit shown
NA = Not analyzed
[1] MTCA Method A Cleanup Standard (Cleanup Standard)
The analytical results that are in bold exceed the Cleanup Standard
Gasoline range hydrocarbons by NWTPH-Gx

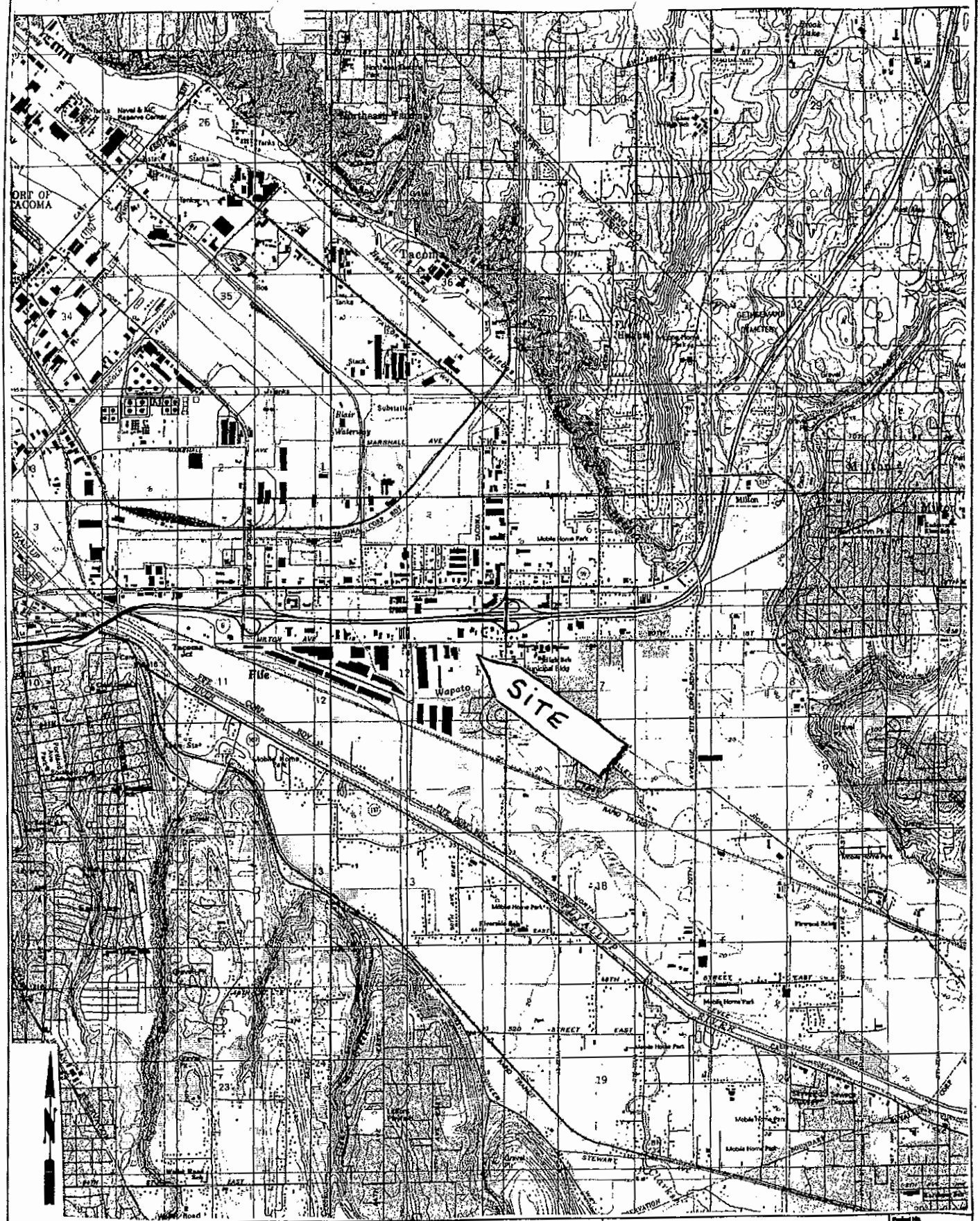
Table 3
Groundwater Analytical Results - VOCs (ug/L)
Card Lock Fuel Sales Facility
Fife, Washington

Sample Identification	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	Cleanup
Parameters	NA	NA	5/20/03	5/20/03	NA	NA	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	

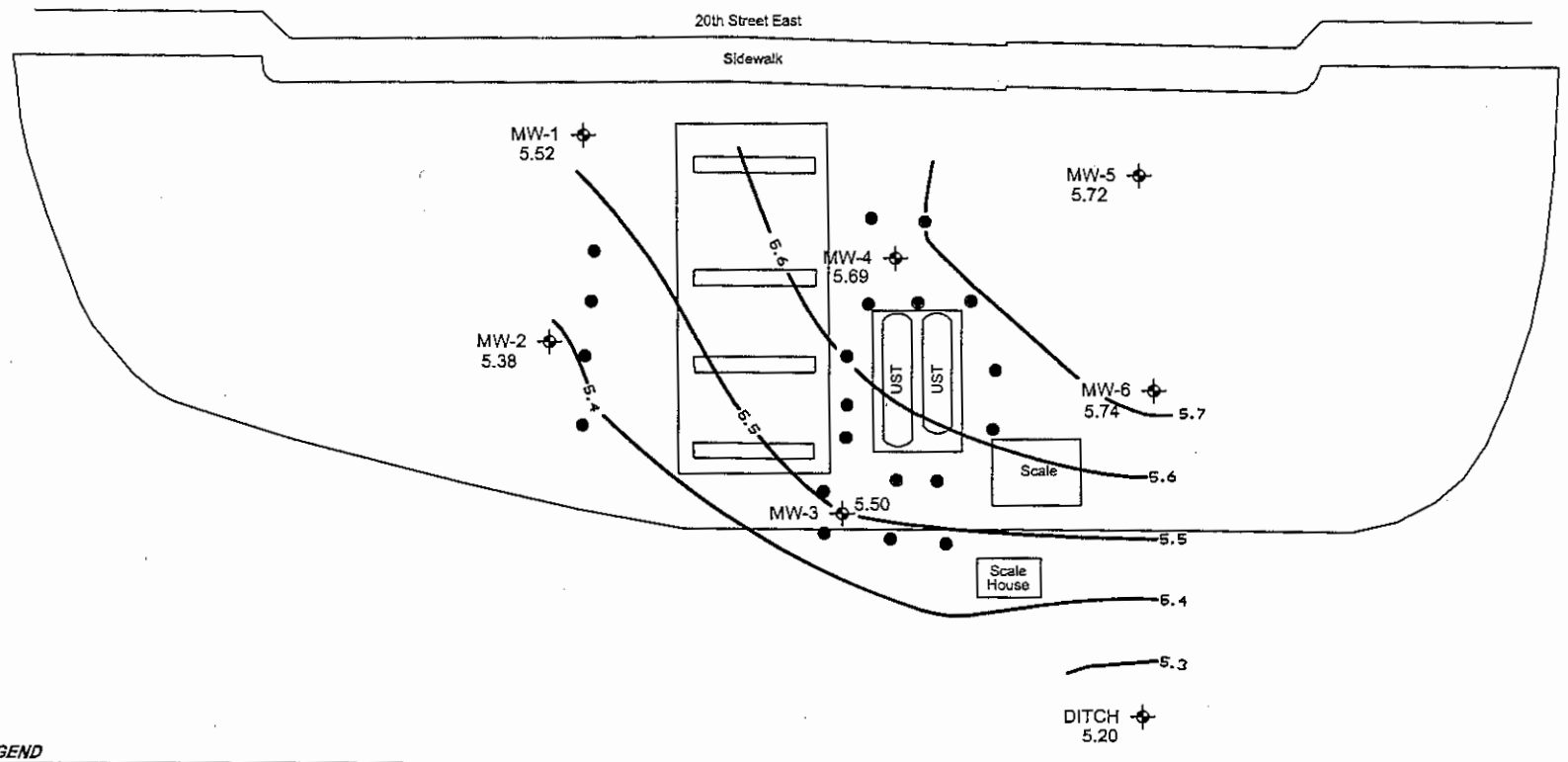
Table 3
Groundwater Analytical Results - VOCs (ug/L)
Card Lock Fuel Sales Facility
Fife, Washington

Sample Identification **Parameters**	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]
4-Chlorotoluene	NA	NA	10 U	1 U	NA	NA	
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:
VOCs = Volatile Organic Compounds
ug/L = Micrograms per liter (parts per billion)
U = Not detected at method reporting limit shown
Volatile Organic Compound analysis by EPA Method 8260B.
NA = Not analyzed
[1] MTCA Method A Cleanup Standards
The analytical results that are in bold exceed the MTCA Method A Cleanup Standards
The Cleanup Standard for xylenes is for total xylenes



PNG ENVIRONMENTAL INC. 1339 Commerce Avenue, Suite 205 Longview, Washington 98632 TEL (360) 414-0666 FAX (360) 414-0883	DATE: 8-4-03 FILE NAME: Fig1 DRAWN BY: AA APPROVED BY: DH	Fife Cordlock Facility Fife, Washington Granley Stewart	Site Location Map	Project No. 1062-01 Figure No. 1



LEGEND

MW-1 ⊕ MONITORING WELL

● INJECTION POINT

GROUNDWATER ELEVATION CONTOUR

5.52 GROUNDWATER ELEVATION

PUMP ISLAND

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:	06/28/03
FILE NAME:	105201-BASE
DRAWN BY:	AA
APPROVED BY:	CH

FIFE CARDLOCK FUEL FACILITY
ORC INJECTION LOCATIONS
FIFE, WASHINGTON

SITE MAP
GROUNDWATER ELEVATION CONTOUR
MAY 20, 2003

Project No. 1052-01

Figure No. 2

ATTACHMENT A
SOIL DISPOSAL MANIFEST

(4708)

Manifest

TPS Technologies Soil Recycling
Non-Hazardous Soils

↓ Manifest # ↓

Date of Shipment:	Responsible for Payment:	Transporter Truck #:	Facility #:	Given by TPS:	Load #
	TRANSPORTER		A03	4377	1

Generator and/or Consultant

Generator Name and Billing Address: EMERALD SERVICES INC 7343 EAST MARGINAL WAY SOUTH SEATTLE, WA 98108 USA	Generator's Phone #: (206) 832-3086	Generator's Job/Site ID No.: COPY
	Generator Contact: MIKE MECHAELIS	
	FAX#: (206) 832-3186	Customer Account Number with TPS: 1001361 / 10
	Consultant's Phone #:	
	Person to Contact:	
	FAX#:	Customer Account Number with TPS: /

Post-it® Fax Note 7671 | Date | # of pages ▶ 2
To Craig | From Pete
Co./Dept. | Co.
Phone # | FAX#

Generation Site (Transport from): *(name & address)* GENERAL PROFILE FOR VACTOR WASTE, CATCH BASINS, OWS, WASH SUMPS PUGET SOUND LOCATIONS SEATTLE, WA 00000 USA	Site Phone #: 206/832-3086	BTEX Levels
	Person to Contact: MIKE MECHAELIS	TPH Levels
	FAX#: 206/832-3186	AVC Levels /
Designated Facility (Transport to): *(name & address)* TPS Technologies Inc. 2800 - 104th Street Court South Lakewood, WA 98499 USA	Facility Phone #: (253) 584-8430	Facility Permit Numbers
	Person to Contact: Renee Avelino	Rica Nelson
	FAX#: (253) 584-8309	
Transporter Name and Mailing Address: EMERALD SERVICES INC 7343 EAST MARGINAL WAY SOUTH SEATTLE, WA 98108 USA	Transporter's Phone #: (206) 832-3086	Transporter's US EPA ID No.:
	Person to Contact: MIKE MECHAELIS	Transporter's DOT No.:
	FAX#: (206) 832-3186	Customer Account Number with TPS: 1001361 / 10

Description of Soil	Moisture Content	Contaminated by:	Approx. Qty:	Description of Delivery	Gross Weight	Tare Weight	Net Weight
Sand ☐ Organic ☐ Clay ☐ Other ☐	0 - 10% ☐ 10 - 20% ☐ 20% - over ☐	Gas ☐ Diesel ☐ Other ☐					
Sand ☐ Organic ☐ Clay ☐ Other ☐	0 - 10% ☐ 10 - 20% ☐ 20% - over ☐	Gas ☐ Diesel ☐ Other ☐		NET TONS=	3.23		

List any exception to items listed above:

Generator's and/or consultant's certification: I/We certify that the soil referenced herein is taken entirely from those soils described in the Soil Data Sheet completed and certified by me/us for the Generation Site shown above and nothing has been added or done to such soil that would alter it in any way.

Print or Type Name: Generator ☐ Consultant ☐ | Signature and date: | Month | Day | Year

Transporter

Transporter's certification: I/We acknowledge receipt of the soil described above and certify that such soil is being delivered in exactly the same condition as when received. I/We further certify that this soil is being directly transported from the Generation Site to the Designated Facility without off-loading, adding to, subtracting from or in any way delaying delivery to such site.

Print or Type Name: Carl A. Kittrell | Signature and date: Carl A Kittrell | Month 5 | Day 21 | Year 03

Recycling Facility

Discrepancies:

Recycling Facility certifies the receipt of the soil covered by this manifest except as noted above:

Print or Type Name: R. AVELINO / R. NELSON | Signature and date: 5/21/03

Please print or type.

GENERATOR / CONSULTANT'S COPY

ATTACHMENT B
GROUNDWATER SAMPLE COLLECTION FORMS

GROUNDWATER
SAMPLE COLLECTION FORM

Well ID no. MW-3
Sample no. MW-3
Date 5-20-03

Project name Fife Caldark
Project no. 1034-01
Collector JWS

Well Information

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

Purge Data

Total well depth ~~8.15~~ 15.35 ft ☐ Clean bottom ☒ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 8.15 ft
Casing volume 7.2 ft (H_2O) X .16 gpf = 1.15 X 3 = 3.45
Casing volumes 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 955 Purge stop time 1001 Purge rate = 1 gpm

Field Parameters

Meter used ☐ YSI ☐ HYDAC ☐ Other

Gallons	pH	Temp	Cond	Turbidity/DT	Comments
1	7.43	60.7	1.83	0.81	Brown Cloudy
2	7.33	58.8	1.58	0.79	"
3 1/2+	7.27	57.7	1.53	0.78	"

DO = 1.7

Sampling Device

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

Bottles Filled Time 1007

Number	Type			Preservative					Filtration	
4	☑ VOA	☐ Amber	☐ Poly	HCL ☑	Nitric ☐	Sulfuric ☐	None ☐	Other ____	☐ Yes	☐ No
2	☐ 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

Samplers Signature JWS Date 5/20/03

GROUNDWATER
SAMPLE COLLECTION FORM

Well ID no MW-4
Sample no. MW-4
Date 5-20-03

Project name Fuhr Cardlock
Project no. 1034-01
Collector JMG

Well Information

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

Purge Data

Total well depth 15.05 ft ☐ Clean bottom ☑ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 7.18 ft
Casing volume 7.87 ft (H_2O) X .16 gpf = 1.25 X 3 = 3.77
Casing volumes 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 1014 Purge stop time 1019 Purge rate ~1 gpm

Field Parameters

Meter used ☐ YSI ☐ HYDAC ☐ Other

Gallons	pH	Temp	Cond	Turbidity NTU	Comments
1 1/2	7.13	64.5	1.91	0.89	Turbid/Muddy
3	7.32	61.1	1.85	0.93	clearing
4	7.34	59.9	1.87	0.95	"

DO = 3.1

Sampling Device

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

Bottles Filled Time 1036

Number	Type			Preservative					Filtration	
4	☑ VOA	☐ Amber	☐ Poly	HCL ☑	Nitric ☐	Sulfuric ☐	None ☐	Other ____	☐ Yes	☐ No
2	☐ 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

Samplers Signature JMG Date 5/20/03

ATTACHMENT C

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

June 4, 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 May 20, 2003 from the Fife-Cardlock, 1034-01, F&BI 305181 project. There are 7 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.

Charlene Morrow

Charlene Morrow
Chemist

Enclosures
PNG0604R.DOC

Date of Report: 06/04/03
Date Received: 05/20/03
Project: Fife-Cardlock, 1034-01, F&BI 305181
Date Extracted: 05/22/03
Date Analyzed: 05/22/03 and 05/23/03

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 73-119)
MW-3 305181-01	1,600	93
MW-4 305181-02	<50	86
Method Blank	<50	94

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-3	Client:	PNG Environmental
Date Received:	05/20/03	Project:	Fife-Cardlock, 1034-01, F&BI 305181
Date Extracted:	05/27/03	Lab ID:	305181-01
Date Analyzed:	05/27/03	Data File:	052710.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	101	50	150
1,2-Dichloroethane-d4	107	50	150
Toluene-d8	100	50	150
4-Bromofluorobenzene	97	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<1	Tetrachloroethene	<1
Vinyl chloride	<1	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	4
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	160	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	7
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon Tetrachloride	<1	tert-Butylbenzene	<1
Benzene	610 ve	1,2,4-Trimethylbenzene	49
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<1
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<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:	05/20/03	Project:	Fife-Cardlock, 1034-01, F&BI 305181
Date Extracted:	05/27/03	Lab ID:	305181-01 1/10
Date Analyzed:	05/29/03	Data File:	052829.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	102	50	150
1,2-Dichloroethane-d4	107	50	150
Toluene-d8	100	50	150
4-Bromofluorobenzene	96	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<10	1,3-Dichloropropane	<10
Chloromethane	<10	Tetrachloroethene	<10
Vinyl chloride	<10	Dibromochloromethane	<10
Bromomethane	<10	1,2-Dibromoethane (EDB)	<10
Chloroethane	<10	Chlorobenzene	<10
Trichlorofluoromethane	<10	Ethylbenzene	<10
Acetone	<500	1,1,1,2-Tetrachloroethane	<10
1,1-Dichloroethene	<10	m,p-Xylene	<10
Methylene chloride	<50	o-Xylene	<10
Methyl t-butyl ether (MTBE)	160	Styrene	<10
trans-1,2-Dichloroethene	<10	Isopropylbenzene	<10
1,1-Dichloroethane	<10	Bromoform	<10
2,2-Dichloropropane	<10	n-Propylbenzene	<10
cis-1,2-Dichloroethene	<10	Bromobenzene	<10
Chloroform	<10	1,3,5-Trimethylbenzene	<10
2-Butanone (MEK)	<100	1,1,2,2-Tetrachloroethane	<10
1,2-Dichloroethane (EDC)	<10	1,2,3-Trichloropropane	<10
1,1,1-Trichloroethane	<10	2-Chlorotoluene	<10
1,1-Dichloropropene	<10	4-Chlorotoluene	<10
Carbon Tetrachloride	<10	tert-Butylbenzene	<10
Benzene	700	1,2,4-Trimethylbenzene	43
Trichloroethene	<10	sec-Butylbenzene	<10
1,2-Dichloropropane	<10	p-Isopropyltoluene	<10
Bromodichloromethane	<10	1,3-Dichlorobenzene	<10
Dibromomethane	<10	1,4-Dichlorobenzene	<10
4-Methyl-2-pentanone	<100	1,2-Dichlorobenzene	<10
cis-1,3-Dichloropropene	<10	1,2-Dibromo-3-chloropropane	<10
Toluene	<10	1,2,4-Trichlorobenzene	<10
trans-1,3-Dichloropropene	<10	Hexachlorobutadiene	<10
1,1,2-Trichloroethane	<10	Naphthalene	<10
2-Hexanone	<100	1,2,3-Trichlorobenzene	<10

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

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-4	Client:	PNG Environmental
Date Received:	05/20/03	Project:	Fife-Cardlock, 1034-01, F&BI 305181
Date Extracted:	05/27/03	Lab ID:	305181-02
Date Analyzed:	05/27/03	Data File:	052711.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	100	50	150
1,2-Dichloroethane-d4	107	50	150
Toluene-d8	101	50	150
4-Bromofluorobenzene	97	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<1	Tetrachloroethene	<1
Vinyl chloride	<1	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<1
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	130	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon Tetrachloride	<1	tert-Butylbenzene	<1
Benzene	11	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<1
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	Method Blank	Client:	PNG Environmental
Date Received:	Not Applicable	Project:	Fife-Cardlock, 1034-01, F&BI 305181
Date Extracted:	05/27/03	Lab ID:	03-574 mb
Date Analyzed:	05/27/03	Data File:	052707.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	101	50	150
1,2-Dichloroethane-d4	101	50	150
Toluene-d8	100	50	150
4-Bromofluorobenzene	96	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<1	Tetrachloroethene	<1
Vinyl chloride	<1	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<1
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon Tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<1	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<1
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Date of Report: 06/04/03
Date Received: 05/20/03
Project: Fife-Cardlock, 1034-01, F&BI 305181

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

Laboratory Code: 305008-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Gasoline	µg/L (ppb)	55,000	57,000	4

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	99	103	62-120	4

Date of Report: 06/04/03
Date Received: 05/20/03
Project: Fife-Cardlock, 1034-01, F&BI 305181

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

Laboratory Code: 305174-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Methyl t-butyl ether (MTBE)	µg/L (ppb)	<1	<1	nm
1,1-Dichloroethene	µg/L (ppb)	<1	<1	nm
Benzene	µg/L (ppb)	2	2	nm
Trichloroethene	µg/L (ppb)	<1	<1	nm
Toluene	µg/L (ppb)	2	1	67 a
Chlorobenzene	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	50-150	1
1,1-Dichloroethene	µg/L (ppb)	50	102	107	50-150	5
Benzene	µg/L (ppb)	50	102	103	50-150	1
Trichloroethene	µg/L (ppb)	50	93	94	50-150	1
Toluene	µg/L (ppb)	50	96	96	50-150	0
Chlorobenzene	µg/L (ppb)	50	99	99	50-150	0

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

a - The analyte was detected at a level less than five times the detection limit. The RPD results may not provide reliable information on the variability of the analysis.

Emerald SERVICES INC.
7343 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON 98108
(206) 832-3000
FAX: (206) 832-3030
24 HOUR EMERGENCY PHONE: 1-800-424-9300

25112

BILL OF LADING AND GALLONAGE TICKET

SHIPPER/GENERATOR Geo Tech / CFN Fuel Station	CONTACT	JOB #
ADDRESS 3200 20th ST. Tacoma / Fife	PHONE#	LOAD # 1
CITY, STATE, ZIP Fife Washington		DATE
CARRIER ESI	PHONE# 206-832-3052	DOCUMENT #
CONSIGNEE TPS	CONTACT Gary & Ray	TRUCK # 73
ADDRESS	PHONE#	PRODUCT TYPE
CITY, STATE, ZIP Tacoma, Washington		EST. GALLONS

HM	ITEM #	U.S. DOT DESCRIPTION	#	TYPE	QTY.
	A	Borings	1	TT	3
	B				
	C				
	D	Estimated weight totals will be collected at facility			

A. WPO # ______ DISP. CODE: 377 C. WPO # ______ DISP. CODE: ______

B. WPO # ______ DISP. CODE: ______ D. WPO # ______ DISP. CODE: ______

DISPOSAL

DUMP DELAY TIME ______

WASH OUT: YES ( ) NO ( ) TIME IN ______ TIME OUT ______

E. WATER ______ GALLONS LOCATION ______ TEST ______ DISP. CODE ______

F. SOLIDS ______ GALLONS LOCATION ______ TEST ______ DISP. CODE ______

______ % SUSPENDED SOLIDS BY CENTRIFUGE + ______ GALS SEDIMENT

G. OIL/DIESEL/GAS ______ GALLONS LOCATION ______ TEST ______ DISP. CODE ______

HOC'S ______ PCB'S ______ B.S.&W. ______ API ______ LAB: Y / N

Shipper's Certification: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway, vessel and rail according to applicable international and national government regulations and this material is not regulated as a hazardous waste in accordance with WAC 173-303, 40 CFR. Part 261 or 40 CFR Part 761.

X [signature] SHIPPER (PRINT NAME) X [signature] SIGNATURE DATE: 5-7

X [signature] CARRIER - DRIVER 1 (PRINT NAME) X [signature] SIGNATURE DATE: 5-7

X ______ CARRIER - DRIVER 2 (PRINT NAME) X ______ SIGNATURE DATE: ______

X ______ CONSIGNEE (PRINT NAME) X ______ SIGNATURE DATE: ______

GROUNDWATER SAMPLE COLLECTION FORM

Well ID no. MW-3
Sample no. MW-3
Date 5-20-03
Project name Fife Cardlock
Project no. 1034-01
Collector JWS

Well Information

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

Purge Data

Total well depth 15.35 ft ☐ Clean bottom ☒ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 8.15 ft
Casing volume 7.2 ft (H_2O) X .16 gpf = 1.15 X 3 = 3.45
Casing volumes 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 955 Purge stop time 1001 Purge rate ~1 g/m

Field Parameters

Meter used ☐ YSI ☐ HYDAC ☐ Other

Gallons	pH	Temp	Cond	Turbidity	Comments
1	7.43	60.7	1.63	0.81	[illegible] clearing
2	7.33	58.8	1.55	0.79	"
3½+	7.31	57.7	1.53	0.78	"

DO = 1.7

Sampling Device

Bailer ☑ Disposable ☐ Stainless ☐ Teflon ☐ Other
Filter Type____ Size____ (micron) ☐ Other
Bailer cord used ☐ Monofilament ☐ Other

Bottles Filled Time 1007

Number	Type	Preservative	Filtration
4	☑ VOA ☐ Amber ☐ Poly	☑ HCL ☐ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
2	☐ 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

Samplers Signature JWS Date 5/20/03

GROUNDWATER SAMPLE COLLECTION FORM

Well ID no. MW-4
Sample no. MW-4
Date 5-20-03

Project name Fife Cardlock
Project no. 1034-01
Collector JMJ

Well Information

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

Purge Data

Total well depth 15.05 ft ☐ Clean bottom ☒ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 7.18 ft
Casing volume 7.87 ft (H_2O) X .16 gpf = 1.25 X 3 = 3.77
Casing volumes 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 1014 Purge stop time 1019 Purge rate ~1gpm

Field Parameters

Meter used ☐ YSI ☐ HYDAC ☐ Other

Gallons	pH	Temp	Cond	Turbidity	Comments
1 1/2	7.13	64.5	1.81	0.48	turbid [illegible]
3	7.22	61.1	1.85	0.93	clearing
4	7.24	59.9	1.87	0.93	"

DO = 3.1

Sampling Device

Bailer	☒ Disposable	☐ Stainless	☐ Teflon	☐ Other
Filter	Type____	Size____ (micron)		☐ Other
Bailer cord used		☐ Monofilament		☐ Other

Bottles Filled Time 1036

Number	Type			Preservative					Filtration	
4	☒ VOA	☐ Amber	☐ Poly	HCL ☒	Nitric ☐	Sulfuric ☐	None ☐	Other ☐	☐ Yes	☐ No
2	☐ 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

Samplers Signature JMJ Date 5/20/03

GROUNDWATER
SAMPLE COLLECTION FORM

Well ID no. MW-4 Project name Fife Cardlock
Sample no. MW-4 Project no. 1034-01
Date 5-20-03 Collector JW

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

Purge Data
Total well depth 15.05 ft ☐ Clean bottom ☑ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 7.18 ft
Casing volume 7.87 ft (H_2O) X .16 gpf = 1.25 X 3 = 3.77
Casing volumes 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 1014 Purge stop time 1019 Purge rate 1 gpm

Field Parameters
Meter used ☐ YSI ☐ HYDAC ☐ Other

Gallons	pH	Temp	Cond	Turbidity NTU	Comments
1 1/2	7.13	64.5	1.31	0.68	Initial Readings
3	7.22	61.1	1.85	0.93	clear
4	7.34	59.9	1.87	0.93	"

DO = 3.1

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

Bottles Filled Time 1026

Number	Type			Preservative					Filtration	
4	☑ VOA	☐ Amber	☐ Poly	HCL ☑	Nitric ☐	Sulfuric ☐	None ☐	Other ____	☐ Yes	☐ No
2	☐ 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

Samplers Signature JW Date 5/20/03

GROUNDWATER
SAMPLE COLLECTION FORM

Well ID no MW-3 Project name Fife Cardlock
Sample no. MW-3 Project no. 1034-01
Date 5-20-03 Collector JWA

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

Purge Data 15.35 ~~8.15~~ 22
Total well depth ~~8.15~~ ft ☐ Clean bottom ☒ Muddy bottom ☐ Not measured
Depth to product — ft
Depth to water 8.15 ft
Casing volume 7.2 ft (H_2O) X .16 gpf = 1.15 X 3 = 3.45
Casing volumes 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 955 Purge stop time 1001 Purge rate ~1 gpm

Field Parameters
Meter used ☐ YSI ☐ HYDAC ☐ Other

Gallons	pH	Temp	Cond	Turbidity NT	Comments
1	7.43	60.7	1.63	0.81	Turbid → Clearing
2	7.33	58.8	1.56	0.79	"
3 1/2+	7.31	57.7	1.53	0.78	"

DO = 1.7

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

Bottles Filled Time 1007

Number	Type	Preservative	Filtration
4	☒ VOA ☐ Amber ☐ Poly	HCL ☒ Nitric ☐ Sulfuric ☐ None ☐ Other	☐ Yes ☐ No
2	☐ 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

Samplers Signature JWA Date 5/20/03

Saltbush

Ground Water Monitoring Report
Fife Cardlock Fuel Facility Project
3200 20th Street East
Fife, Washington 98424
Project No. 02092m1477
February 14, 2003

Prepared for:

Grenley Stewart Resources, Inc.
Mr. Rob Grenley & Mr. Greg Stewart
1019 Pacific Avenue, Suite 1315
Tacoma, Washington 98402

The on-site dates for this project were January 9 and 13, 2003.

Questions regarding this report, the presentation of the information, and the interpretation of the data are welcome and should be referred to the Project Manager.

Franz A. Carmine, Project Manager

John F. Hildenbrand, Principal/Env. Scientist

Dennis E. Salt, Principal

1477-2m/20th Street East\Monitoring Report.doc

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REPORT DISTRIBUTION

1 Copy	Grenley Stewart Resources, Inc.
1 Copy	Mr. Hank Seipt, Bristol Environmental, Inc.
1 Copy	Ms. Beth Muhler, Investors Underwriting
1 Copy	Ms. Carol Johnston, Ecology
1 Copy	Saltbush Environmental Services, Inc. (Project Reference # 02092m1477)

1.0 INTRODUCTION

1.1 Purpose and Objectives

This report presents the results of the January 2003 ground water monitoring event at the Fife Cardlock fuel facility. The purpose of this project is to assess the potential for accelerated natural attenuation using an Oxygen Release Compound (ORC) and monitor the chemical quality of ground water. In addition, this investigation was performed to determine the local ground water gradient as well as to determine whether related soil contamination was present at the site. The site is located at 3200 20th Street East, Fife, Washington. Services provided for this project were authorized by Grenley Stewart Resources, Inc. on August 15, 2002.

1.2 Project Summary

Ground water samples were obtained from each of the six monitoring wells. Samples obtained were screened using visual characteristics, odor, sheen and portable field instrumentation for dissolved Oxygen, pH, temperature, specific conductance and total dissolved solids. Chemical testing was conducted for the presence of Benzene, Toluene, Ethylbenzene and Xylenes by EPA Test Method 8021B, gasoline-range petroleum hydrocarbons by Ecology Test Method NWTPH-Gx, Volatile Organic Compounds (VOCs) by EPA Method 8260, Total Lead and Dissolved Manganese by EPA Method 6010, Ferrous Iron and Dissolved Oxygen. The monitoring wells were subsequently resurveyed on January 13, 2003.

1.3 Project Personnel

Project Manager:	Franz A. Carmine
Senior Environmental Scientist:	John F. Hildenbrand
Principal:	Dennis E. Salt
Laboratory:	Environmental Services Northwest, Inc.
Hydrogeological Services:	Robinson & Noble, Inc.

2.0 BACKGROUND INFORMATION

2.1 Site Identification

The subject site is situated between 20th Street East and Interstate-5 in a commercial and industrial area. More specifically, the site is located at 3200 20th Street East, Fife, Washington 98424. The site consists of an asphalt-paved cardlock fueling station. The site contains a canopy, pump island, weigh-scale, scale-house and restroom facilities on 51,836 square-feet of land. The underground storage tanks located on the site contain gasoline- and diesel-range petroleum hydrocarbons.

2.2 Regional Geology/Hydrogeology

The primary soils at this site, as mapped by the **Soil Survey of Pierce Couuty Area, U.S. Department of Agriculture**, are Sultan silt loam. This nearly level soil is moderately well drained. This soil is located on the bottom lands of the Puyallup and White Rivers from sea level to approximately 100-feet in elevation. Soil permeability is moderately slow, with a high available water capacity. This soil exhibits a slight erosion hazard. In addition to the primary soils, areas of fill (usually marine dredge spoils) are not uncommon.

According to the Ground Water Resource Evaluation, Existing and New Supply Areas, 1986, City of Tacoma, the subject site is located within the Lower Puyallup River Valley. This area serves as the collection point for ground water near the Puyallup River and neighboring upland areas. The subsurface geology of the area proximal to the subject site exhibits fine grained particles consistent with deposition in terminal river valleys. Alluvial sediments generally overlay formations that are more permeable. Depth to ground water generally ranges from 5 to 15 feet and may be influenced by tides and seasonal fluctuations. Ground water flow direction is estimated to trend generally toward the north, northwest.

2.3 Previous Investigations/Activities

In August 2002, Bristol Environmental Inc. conducted a Limited Phase II Environmental Site Investigation at the Fife Cardlock Fuel facility. Two in-service underground storage tanks (USTs) containing gasoline and diesel are located on the site. Bristol Environmental attempted to determine the concentration and extent of a known gasoline release relating to periodic overfilling of a product overflow tank. The analytical test results, from soil and water samples obtained from the borings, indicated concentrations of gasoline-range petroleum hydrocarbons in water that exceeded the Model Toxics Control Act (MTCA) Method A cleanup level. According to the report, the UST area was primarily impacted by the contamination. The report recommended further assessment of site conditions and further investigation of the shallow ground water system beneath the site for possible impact by gasoline-range petroleum hydrocarbons.

In October 2002 Saltbush Environmental Services Inc. (Saltbush) placed ten soil borings on the subject property in an attempt to delineate the contaminant plume identified in the study performed by Bristol Environmental. Seven of the ten borings reached ground water. The soil borings were placed in the area surrounding the in-service underground storage tanks located on the property. Soil and ground water samples obtained were screened using visual characteristics,

odor, sheen and portable field instrumentation. Laboratory testing was conducted for the presence of Benzene, Toluene, Ethylbenzene and Xylenes and gasoline-range petroleum hydrocarbons.

After the information from the Geoprobe borings was reviewed, monitoring well locations were selected based on the findings. Six ground water monitoring wells were developed to approximately 18-feet below the ground surface. A survey was conducted to determine relative elevations of the wells. This data facilitated determining the depth to ground water and ground water flow direction. Ground water samples obtained from each monitoring well on October 9, 2002 were in excess of MTCA Method A cleanup levels for Benzene in soil and Benzene, Xylenes and gasoline-range petroleum hydrocarbons in water.

3.0 GROUND WATER MONITORING

3.1 Ground Water Monitoring Well Construction

Six ground water monitoring wells were placed on the site October 8, 2002 and were labeled on the site diagram as MW-1, MW-2, MW-3, MW-4, MW-5 and MW-6. These wells were advanced to an average depth of 18-feet below the ground surface. The wells were constructed with two-inch diameter schedule 40 PVC coupled with flush threaded joints. Ten feet of 0.020-inch slot PVC screen was installed with a slip cap screwed to the end of the assembly as a bottom cap. Blank PVC riser extends from the top of the screen, at five feet, to just below the ground surface. The screen was packed in Colorado Silica Products 10-20 sand. The filter pack extends from the bottom of the boring to three feet below the ground surface. The remaining space was filled with hydrated bentonite chips to within one foot of the surface. The flush monument was set in a concrete pad.

3.2 Current Sampling Procedures

Saltbush personnel conducted the ground water sampling on January 9, 2003. The monitoring wells were also resurveyed on January 13, 2003. The ground water depth was measured in each well and the wells were purged and sampled (Table 1). Sampling, and purging of at least three volumes, was accomplished by the use of a low-flow peristaltic pump. During the purging phase the water was tested for dissolved oxygen, pH, temperature, specific conductance and total dissolved solids. After the purging of each well was completed and test parameters were stabilized. Samples were placed into laboratory-supplied, pre-cleaned containers with the proper preservatives. All samples were immediately placed into an ice chest and maintained at approximately 4° Celsius (C). A chain-of-custody was prepared and all the samples were delivered to ESN, Lacey, Washington, for analysis.

Table # 1 - Depth to Ground Water/Ground Water Elevations

Location	Surface Elevation*	Depth to Ground Water	Ground Water Elevation*
MW-1	100.445 ft	6.22 ft	94.12 ft
MW-2	100.930 ft	6.83 ft	94.13 ft
MW-3	102.060 ft	7.88 ft	94.25 ft
MW-4	101.275 ft	6.91 ft	94.38 ft
MW-5	100.000 ft	5.51 ft	94.49 ft
MW-6	101.320 ft	6.78 ft	94.59 ft

* Elevation is relative to TBM (100.0 feet) and does not denote actual elevation.
See site diagram for location of TBM and monitoring wells.

3.3 Test Methods

3.3.1 Method NWTPH-Gx

Washington State Department of Ecology (Ecology) Method NWTPH-Gx is the qualitative and quantitative method (extended) for volatile ("gasoline") petroleum products in soil and water. Petroleum products applicable for this method include aviation and automotive gasolines, mineral spirits, stoddard solvent and naptha.

3.3.2 EPA Method 8260

EPA Method 8260 is used to quantify a range of VOCs, including target compounds such as Methyl Tertiary Butyl Ether (MTBE), Benzene, Toluene, Ethylbenzene and Xylenes.

The detection limits of all analytical procedures coincided with the detection limits necessary to determine cleanup levels as established by the Model Toxics Control Act (MTCA). Analytical methods used to evaluate the effectiveness of a cleanup action were compliant with the requirements in 173-340-707 WAC and 173-340-830 WAC. NWTPH-Gx is the qualitative and quantitative method (extended) for volatile ("Gasoline") petroleum products in soil and water. Petroleum products applicable for this method include aviation and automotive gasoline, mineral spirits, Stoddard solvent and naphtha.

3.3.3 EPA Method 6010

Total Lead is the quantitative method for water possibly contaminated with leaded gasoline. Methods used for this test is EPA Method 6010. Dissolved Manganese also utilizes this test method.

3.4 Test Results

Ground water samples from six monitoring wells were analyzed for the presence of target compounds including VOCs, Gasoline and Total Lead. Target VOCs, including BTEX and MTBE, are included in Table 2, below. Dissolved Manganese, Ferrous Iron and Dissolved Oxygen were also analyzed in an attempt to assess the potential for accelerated natural attenuation using an Oxygen Release Compound (ORC). These analytes are shown in Table 3.

MW-3 contained concentrations of Gasoline, Benzene and MTBE above MTCA Method A cleanup levels for ground water. MW-4 contained levels of Benzene and MTBE that were above applicable cleanup levels, while MW-2 yielded concentrations of MTBE above the MTCA Method A cleanup limit.

Table #2 - Current Test Results (iu µg/l, parts per billion)

Sample ID	G	B	T	E	Total X	MTBE	Total Pb
			January 9, 2003				
MW-1	ND	ND	2.4	ND	4.3	ND	ND
MW-2	ND	ND	ND	ND	ND	**32**	ND
MW-3	**3,900**	**2,900**	1.1	ND	5.4	**140**	ND
MW-4	ND	**33**	ND	ND	ND	**160**	ND
MW-5	ND	ND	ND	ND	ND	ND	ND
MW-6	ND	ND	ND	ND	ND	ND	ND
MTCA Method A	**800**	**5.0**	**1,000**	**700**	**1,000**	**15.0**	**5.0**

Note: Gasoline (G), Benzene (B), Toluene (T), Ethylbenzene (E), total Xylenes (X), Methyl Tertiary Butyl Ether (MTBE), and total Lead (Pb).
Bold indicates sample concentration is at or above the MTCA Metbod A level for ground water.
ND indicates analyte not detected.

Note: Please refer to the Analytical Results in Appendix 3 for additional VOC concentrations.

Table #3 - Current Test Results (in mg/l, parts per million)

Sample ID	Total Pb	M	F.I.	D.O.
		January 9, 2003		
MW-1	ND	10.30	4.2	2.9
MW-2	ND	7.96	2.6	2.7
MW-3	ND	6.46	2.1	2.4
MW-4	ND	5.73	ND	5.2
MW-5	ND	7.72	9.0	1.4
MW-6	ND	9.56	13.0	3.1
MTCA Method A	**15**	**N/A**	**N/A**	**N/A**

Table shows total Lead (Pb), Dissolved Manganese (M), Ferrous Iron (F.I.), and Dissolved Oxygen (D.O.).
ND indicates analyte not detected.

Analytical results indicated MW-3 contained concentrations of Gasoline, Benzene and MTBE above MTCA Method A cleanup levels for ground water. MW-4 contained levels of Benzene and MTBE that were above applicable cleanup levels, while MW-2 yielded concentrations of MTBE above the MTCA Method A cleanup limit.

Samples were analyzed for Ferrous Iron and Dissolved Oxygen in order to determine the oxidation and reduction characteristics of the subsurface soils. This information will aid in determining the effectiveness of using an Oxygen Release Compound (ORC) to accelerate bioremediation of the target compounds outlined above. The analytical results were reviewed by Mr. Jack Peabody of Regenesis, the manufacturer of ORC, who indicated the soil conditions are conducive to using ORC.

4.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

4.1 Sample Collection

Samples were placed directly into pre-cleaned laboratory-prepared glass sample jars, after visual observation and field screening. Samples were immediately tranferred to a cooler after completion of labeling. Samples were maintained at approximately 4 °C.

4.2 Chain-of-Custody

Samples sent to both the on- and off-site laboratories were appropriately logged on a correctly completed chain-of-custody form. The form was reviewed by the project manager for completeness and no inconsistencies were noted.

4.3 Quality Assurance/Quality Control (QA/QC)

There were no significant problems or deviations reported by the analytical laboratory (ESN).

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The six ground water monitoring wells located on the site were sampled on January 9, 2003. These samples were analyzed for total Lead, dissolved Manganese, Dissolved Oxygen, Ferrous Iron, VOCs and gasoline-range petroleum hydrocarbons. Analytical results indicated MW-3 contained concentrations of Gasoline, Benzene and MTBE above MTCA Method A cleanup levels for ground water. MW-4 contained levels of Benzene and MTBE that were above applicable cleanup levels, while MW-2 yielded concentrations of MTBE above the MTCA Method A cleanup limit.

The contaminated ground water appears to be limited to the southeast and west sections of the UST area. Based on the ground water information gathered in this study, the gradient in the area appears nearly level, gently grading in a westerly direction. The results appear to indicate that the ground water contamination has migrated below the pump islands to MW-2, but has not migrated across the entire site since the time of the product release.

5.2 Recommendations

Samples were analyzed for Ferrous Iron and Dissolved Oxygen in order to determine the oxidation and reduction characteristics of the subsurface soils. Mr. Jack Peabody of Regenesis, indicated the oxidation characteristics of the soil will not inhibit the use of an Oxygen Release Compound (ORC). As previously proposed, ORC injection appears to be the most economical and practical remedial option. We recommend that ORC remediation, including quarterly ground water monitoring, be implemented at the site.

6.0 LIMITATIONS

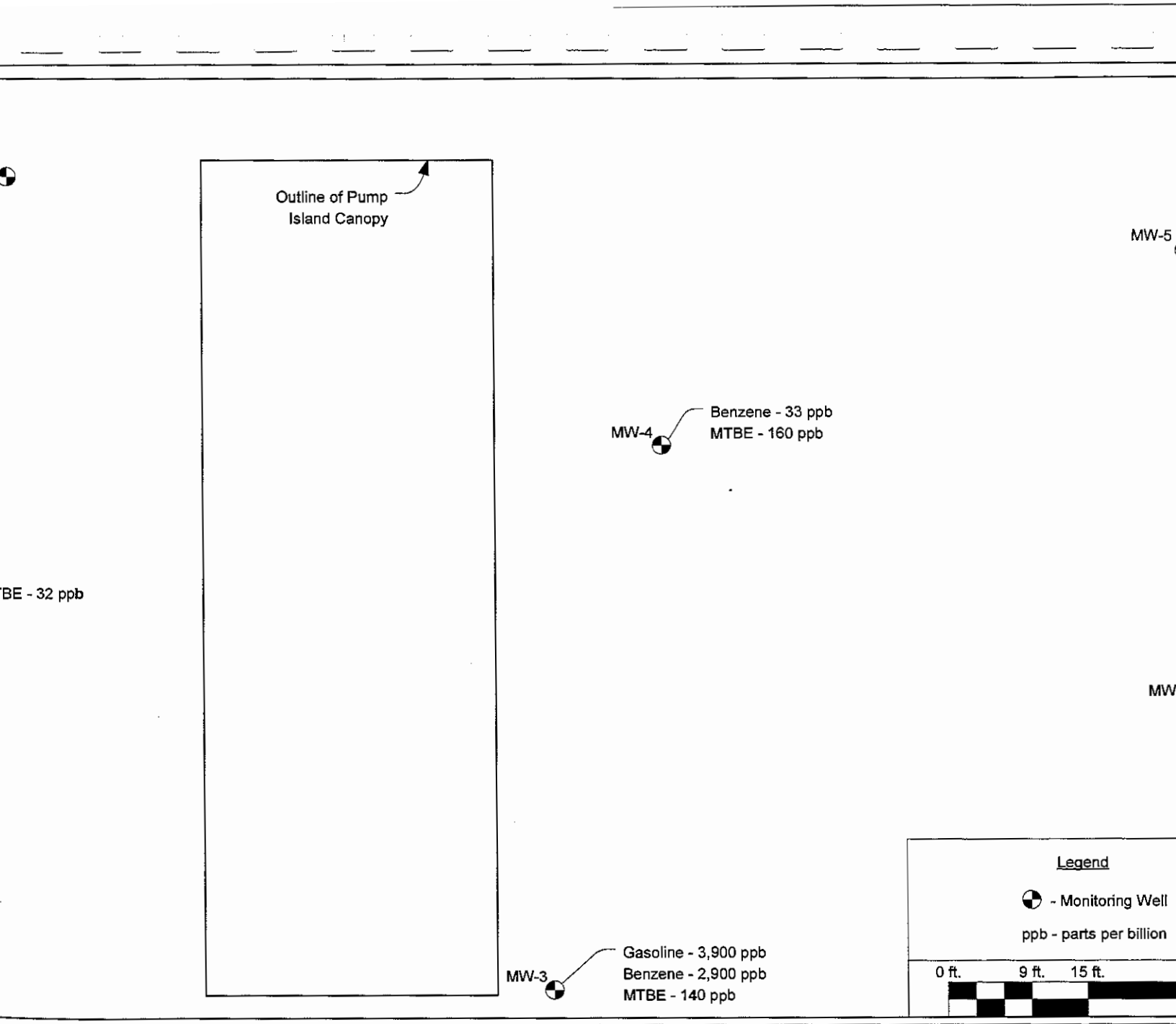
The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. Since site conditions and regulations beyond our control could change at any time after the completion of our site visit, we are not responsible for the impacts of any changes in environmental conditions, standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

7.0 CLOSURE

This concludes the investigation and presentation of material gathered on the herein-described site for the tasks described for this limited study. Saltbush Environmental Services, Inc. will be pleased to assist with any further requirements that may be necessary for this property.

Thank you for allowing us the opportunity to be of service to you. If you have questions regarding this report or require further discussion of any portion of this project, we will be pleased to offer our assistance.



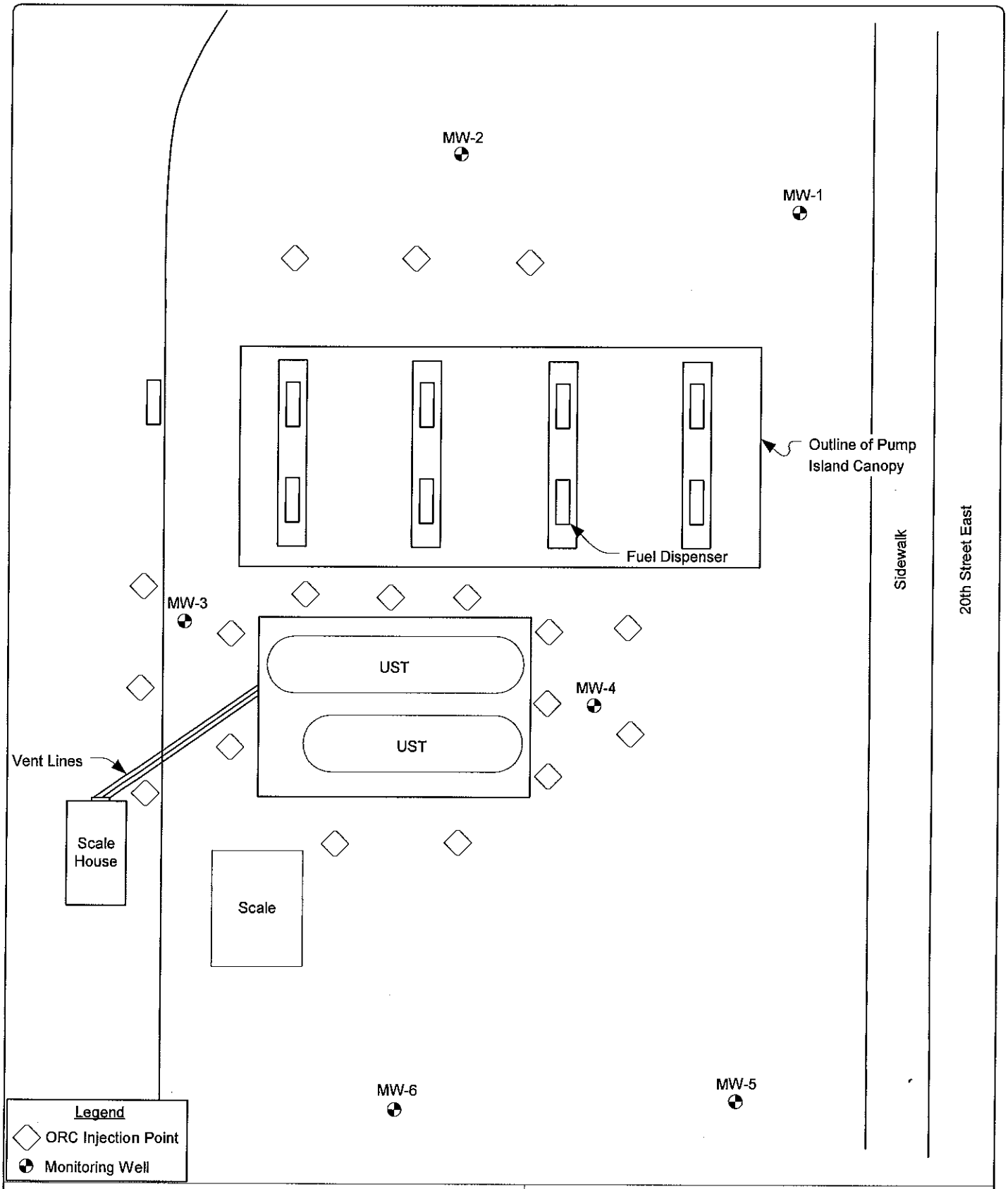
Site Diagram
he 2300 20th Street East Project

N

Project Number:
02092m1477

Saltbush Environmental Services, Inc.
805 Pacific Avenue P.O. Box 505
Tacoma, WA 98401-0505

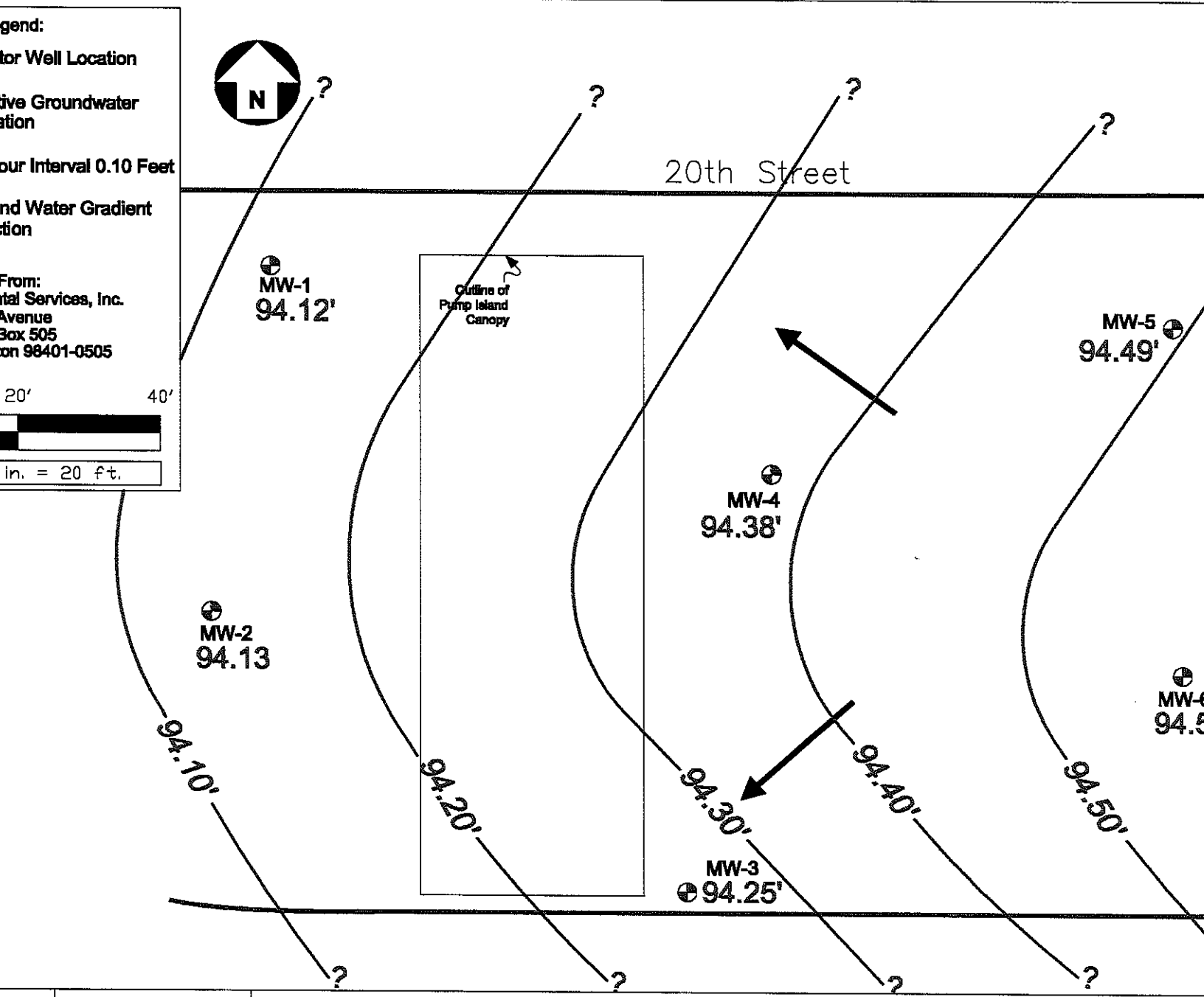
Diagram #1



Saltbush Environmental Services, Inc.
805 Pacific Avenue
P.O. Box 505
Tacoma, WA 98401-0505
Tel. (253) 383-1914 Fax (253) 383-4525
Operations@Saltbush.com

Proposed ORC Injection Locations
The Fife Cardlock Fuel Facility Project
Tacoma, Washington 98402

Project Number:	Drawn By:	Date:	No Scale	Diagram # 2 of 2
020821477	Franz A. Carmine	February 12, 2003	Locations Estimated	1477-2/Diagram 2



T 20 N/R 3 E - 11
PM: MFP
OCTOBER 2002
JOB. NO. 6704M

E, INC.

GROUNDWATER SURFACE CONTOU
WATER LEVELS MEASURED JANUARY
SALTBUSH ENVIRONMENTAL SERVIC

ESN NORTHWEST CHEMISTRY LABORATORY

GRENLY-STEWART PROJECT
Fife, Washington
Saltbush Environmental Services, Inc.
Client Project #1477-2M

Analyses of Gasoline (NWTPH-Gx) in Water

Sample Number	Date Analyzed	Surrogate Recovery (%)	Gasoline (ug/l)
Method Blank	1/13/03	87	nd
MW-1	1/13/03	100	nd
MW-1 Dup.	1/14/03	80	nd
MW-2	1/13/03	69	nd
MW-3	1/14/03	84	3,900
MW-4	1/13/03	118	nd
MW-5	1/13/03	84	nd
MW-6	1/14/03	93	nd
Method Detection Limits			100

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene): 65% TO 135%

ANALYSES PERFORMED BY: Marilyn Farmer & Dean Phillips

ESN NORTHWEST CHEMISTRY LABORATORY

GRENLY-STEWART PROJECT
Fife, Washington
Saltbush Environmental Services, Inc.
Client Project #1477-2M

Analyses of Dissolved Oxygen in Water

Sample Number	Date Analyzed	Dissolved Oxygen (mg/l)
Method Blank	1/17/03	8.5
MW-1	1/17/03	2.9
MW-2	1/17/03	2.7
MW-3	1/17/03	2.4
MW-4	1/17/03	5.2
MW-5	1/17/03	1.4
MW-6	1/17/03	3.1
MW-6 Dup	1/17/03	2.5
Method Detection Limits		1

"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ANALYSES PERFORMED BY: Dean Phillips

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number: S30115-2
Client: SALTBUSH
Client Job Name: GRENLY-STEWART
Client Job Number: 1477-2M

Analytical Results

8260, µg/L		MTH BLK	LCS	MW-1	MW-2	MW-3	MW-4
Matrix	Water	Water	Water	Water	Water	Water	Water
Date extracted	Reporting	01/15/03	01/15/03	01/15/03	01/15/03	01/15/03	01/15/03
Date analyzed	Limits	01/15/03	01/15/03	01/15/03	01/15/03	01/15/03	01/15/03
Dichlorodifluoromethane	1.0	nd		nd	nd	nd	nd
Chloromethane	1.0	nd		nd	nd	nd	nd
Vinyl chloride	0.2	nd		nd	nd	nd	nd
Bromomethane	1.0	nd		nd	nd	nd	nd
Chloroethane	1.0	nd		nd	nd	nd	nd
Trichlorofluoromethane	1.0	nd		nd	nd	nd	nd
1,1-Dichloroethene	1.0	nd		nd	nd	nd	nd
Methylene chloride	1.0	nd		nd	nd	nd	nd
trans-1,2-Dichloroethene	1.0	nd		nd	nd	nd	nd
1,1-Dichloroethane	1.0	nd		nd	nd	nd	nd
cis-1,2-Dichloroethene	1.0	nd		nd	nd	nd	nd
2,2-Dichloropropane	1.0	nd		nd	nd	nd	nd
Chloroform	1.0	nd		nd	nd	nd	nd
Bromochloromethane	1.0	nd		nd	nd	nd	nd
1,1,1-Trichloroethane	1.0	nd		nd	nd	nd	nd
1,2-Dichloroethane	1.0	nd		nd	nd	nd	nd
1,1-Dichloropropene	1.0	nd		nd	nd	nd	nd
Carbon tetrachloride	1.0	nd		nd	nd	nd	nd
Benzene	1.0	nd	120%	nd	nd	2,900	33
Trichloroethene	1.0	nd	118%	nd	nd	nd	nd
1,2-Dichloropropane	1.0	nd		nd	nd	nd	nd
Dibromomethane	1.0	nd		nd	nd	nd	nd
Bromodichloromethane	1.0	nd		nd	nd	nd	nd
cis-1,3-Dichloropropene	1.0	nd		nd	nd	nd	nd
Toluene	1.0	nd	98%	2.4	nd	1.1	nd
trans-1,3-Dichloropropene	1.0	nd		nd	nd	nd	nd
1,1,2-Trichloroethane	1.0	nd		nd	nd	nd	nd
1,3-Dichloropropane	1.0	nd		nd	nd	nd	nd
Dibromochloromethane	1.0	nd		nd	nd	nd	nd
Tetrachloroethene	1.0	nd		nd	nd	nd	nd
1,2-Dibromoethane (EDB)(*)	0.01	nd		nd	nd	nd	nd
Chlorobenzene	1.0	nd	98%	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	1.0	nd		nd	nd	nd	nd
Ethylbenzene	1.0	nd		nd	nd	nd	nd
Xylenes	1.0	nd		4.3	nd	5.4	nd
Styrene	1.0	nd		nd	nd	nd	nd
Bromoform	1.0	nd		nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	1.0	nd		nd	nd	nd	nd
Isopropylbenzene	1.0	nd		nd	nd	nd	nd
1,2,3-Trichloropropane	1.0	nd		nd	nd	nd	nd
Bromobenzene	1.0	nd		nd	nd	nd	nd
n-Propylbenzene	1.0	nd		nd	nd	nd	nd
2-Chlorotoluene	1.0	nd		nd	nd	nd	nd
4-Chlorotoluene	1.0	nd		nd	nd	nd	nd
1,3,5-Trimethylbenzene	1.0	nd		nd	nd	6.8	nd
tert-Butylbenzene	1.0	nd		nd	nd	nd	nd
1,2,4-Trimethylbenzene	1.0	nd		nd	nd	57	nd
sec-Butylbenzene	1.0	nd		nd	nd	nd	nd
1,3-Dichlorobenzene	1.0	nd		nd	nd	nd	nd
1,4-Dichlorobenzene	1.0	nd		nd	nd	nd	nd
Isopropyltoluene	1.0	nd		nd	nd	nd	nd
1,2-Dichlorobenzene	1.0	nd		nd	nd	nd	nd
n-Butylbenzene	1.0	nd		nd	nd	nd	nd
1,2-Dibromo-3-Chloropropane	1.0	nd		nd	nd	nd	nd
1,2,4-Trichlorobenzene	1.0	nd		nd	nd	nd	nd
Naphthalene	1.0	nd		4.3	nd	nd	nd
MTBE	5.0	nd		nd	32	140	160
1,2,3-Trichlorobenzene	1.0	nd		nd	nd	nd	nd

*-instrument detection limits

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number:	S30115-2
Client:	SALTBUSH
Client Job Name:	GRENLY-STEWART
Client Job Number:	1477-2M

Analytical Results

8260, µg/L		MTH BLK	LCS	MW-1	MW-2	MW-3	MW-4
Matrix	Water	Water	Water	Water	Water	Water	Water
Date extracted	Reporting	01/15/03	01/15/03	01/15/03	01/15/03	01/15/03	01/15/03
Date analyzed	Limits	01/15/03	01/15/03	01/15/03	01/15/03	01/15/03	01/15/03
Surrogate recoveries							
Dibromofluoromethane		125%	122%	124%	127%	123%	126%
Toluene-d8		82%	82%	78%	79%	80%	79%
4-Bromofluorobenzene		108%	100%	96%	98%	96%	96%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number:	S30115-2
Client:	SALTBUSH
Client Job Name:	GRENLY-STEWART
Client Job Number:	1477-2M

Analytical Results

8260, µg/L		MW-5	MW-6
Matrix	Water	Water	Water
Date extracted	Reporting	01/15/03	01/15/03
Date analyzed	Limits	01/15/03	01/15/03
Dichlorodifluoromethane	1.0	nd	nd
Chloromethane	1.0	nd	nd
Vinyl chloride	0.2	nd	nd
Bromomethane	1.0	nd	nd
Chloroethane	1.0	nd	nd
Trichlorofluoromethane	1.0	nd	nd
1,1-Dichloroethene	1.0	nd	nd
Methylene chloride	1.0	nd	nd
trans-1,2-Dichloroethene	1.0	nd	nd
1,1-Dichloroethane	1.0	nd	nd
cis-1,2-Dichloroethene	1.0	nd	nd
2,2-Dichloropropane	1.0	nd	nd
Chloroform	1.0	nd	nd
Bromochloromethane	1.0	nd	nd
1,1,1-Trichloroethane	1.0	nd	nd
1,2-Dichloroethane	1.0	nd	nd
1,1-Dichloropropene	1.0	nd	nd
Carbon tetrachloride	1.0	nd	nd
Benzene	1.0	nd	nd
Trichloroethene	1.0	nd	nd
1,2-Dichloropropane	1.0	nd	nd
Dibromomethane	1.0	nd	nd
Bromodichloromethane	1.0	nd	nd
cis-1,3-Dichloropropene	1.0	nd	nd
Toluene	1.0	nd	nd
trans-1,3-Dichloropropene	1.0	nd	nd
1,1,2-Trichloroethane	1.0	nd	nd
1,3-Dichloropropane	1.0	nd	nd
Dibromochloromethane	1.0	nd	nd
Tetrachloroethene	1.0	nd	nd
1,2-Dibromoethane (EDB)(*)	0.01	nd	nd
Chlorobenzene	1.0	nd	nd
1,1,1,2-Tetrachloroethane	1.0	nd	nd
Ethylbenzene	1.0	nd	nd
Xylenes	1.0	nd	nd
Styrene	1.0	nd	nd
Bromoform	1.0	nd	nd
1,1,2,2-Tetrachloroethane	1.0	nd	nd
Isopropylbenzene	1.0	nd	nd
1,2,3-Trichloropropane	1.0	nd	nd
Bromobenzene	1.0	nd	nd
n-Propylbenzene	1.0	nd	nd
2-Chlorotoluene	1.0	nd	nd
4-Chlorotoluene	1.0	nd	nd
1,3,5-Trimethylbenzene	1.0	nd	nd
tert-Butylbenzene	1.0	nd	nd
1,2,4-Trimethylbenzene	1.0	nd	nd
sec-Butylbenzene	1.0	nd	nd
1,3-Dichlorobenzene	1.0	nd	nd
1,4-Dichlorobenzene	1.0	nd	nd
Isopropyltoluene	1.0	nd	nd
1,2-Dichlorobenzene	1.0	nd	nd
n-Butylbenzene	1.0	nd	nd
1,2-Dibromo-3-Chloropropane	1.0	nd	nd
1,2,4-Trichlorobenzene	1.0	nd	nd
Naphthalene	1.0	nd	nd
MTBE	5.0	nd	nd
1,2,3-Trichlorobenzene	1.0	nd	nd

*-instrument detection limits

ESN SEATTLE CHEMISTRY LABORATORY
(425) 957-9872, fax (425) 957-9904

ESN Job Number:	S30115-2
Client:	SALTBUSH
Client Job Name:	GRENLY-STEWART
Client Job Number:	1477-2M

Analytical Results

8260, µg/L		MW-5	MW-6
Matrix	Water	Water	Water
Date extracted	Reporting	01/15/03	01/15/03
Date analyzed	Limits	01/15/03	01/15/03
Surrogate recoveries			
Dibromofluoromethane		128%	126%
Toluene-d8		79%	79%
4-Bromofluorobenzene		96%	101%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

ESN NORTHWEST CHEMISTRY LABORATORY

GREENLY-STEWART PROJECT
Fife, Washington
Saltbush Environmental Services, Incorporated
Client Project #1477-2m

Ferrous Iron in Water

Sample Number	Date Analyzed	Ferrous Iron (Fe^{+2}) (mg/l)
Method Blank	1/27/2003	nd
MW-1	1/27/2003	4.2
MW-2	1/27/2003	2.6
MW-3	1/27/2003	2.1
MW-4	1/27/2003	nd
MW-4 Dup	1/27/2003	nd
MW-5	1/27/2003	9.0
MW-6	1/27/2003	13
Method Detection Limits		0.02

"nd" Indicates not detected at listed detection limits.

ANALYSES PERFORMED BY: Dean Phillips

ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RE

althoust Environmental

605 Pacific Av, Tacoma, WA 98401

53 383 1914 FAX: 383 4525

DATE: 1/10/02 PAGE 1 OF

PROJECT NAME: Grundy - Stewart

LOCATION: Fife

OJECT #: 1477-2m PROJECT MANAGER: Jon

COLLECTOR: Jon

DATE COLLE

ber	Depth	Time	Sample Type	Container Type	ANALYSES: VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	NW TPH-GRX	JOC - 8260B	Lead - 7600 series	Ferrous Iron	Dissolved Manganese	Dissolved Oxygen	NOTES
			H2O	-														X	X	X	X	X	X	
				-														X	X	X	X	X	X	
				-														X	X	X	X	X	X	
H				-														X	X	X	X	X	X	
5				-														X	X	X	X	X	X	
				-														X	X	X	X	X	X	

BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
	1/10/02 9:25	Jon McCall	1/10/02 925
BY (Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES:

Please analyze samples for Iron & Dissolved Manganese

Turn Around Time: 5 d

STL Seattle
5755 8th Street East
Tacoma, WA 98424

Tel: 253 922 2310
Fax: 253 922 5047
www.stl-inc.com

TRANSMITTAL MEMORANDUM

DATE: January 16, 2003

TO: Mike Korosec
ESN Northwest, Inc.
677 Woodland Square Loop SE, Ste. D
Lacey, WA 98503

PROJECT: Grenly -Stewart

REPORT NUMBER: 111209

TOTAL NUMBER OF PAGES: 14

Enclosed are the test results for six samples received at STL Seattle on January 13, 2003.

Ferrous Iron analysis was indicated on the chain-of-custody, however per Dean Phillips on January 13, 2003, ferrous iron was not to be analyzed by STL.

The report consists of this transmittal memo, analytical results, quality control reports, a copy of the chain-of-custody, a list of data qualifiers and analytical narrative when applicable, and a copy of any requested raw data.

Should there be any questions regarding this report, please contact me at (253) 922-2310.

Sincerely,

Anne Fowler
Project Manager

STL Seattle

Sample Identification:

Lab. No.	Client ID	Date/Time Sampled	Matrix
111209-1	MW-1		Liquid
111209-2	MW-2		Liquid
111209-3	MW-3		Liquid
111209-4	MW-4		Liquid
111209-5	MW-5		Liquid
111209-6	MW-6		Liquid

STL Seattle

Client Name	ESN Northwest, Inc.
Client ID:	MW-1
Lab ID:	111209-01
Date Received:	1/13/03
Date Prepared:	1/14/03
Date Analyzed:	1/14/03
Dilution Factor	1

Dissolved Metals by ICP - USEPA Method 6010

Analyte	Result (mg/L)	PQL	Flags
Lead	ND	0.01	
Manganese	10.3	0.01	

STL Seattle

Client Name	ESN Northwest, Inc.
Client ID:	MW-2
Lab ID:	111209-02
Date Received:	1/13/03
Date Prepared:	1/14/03
Date Analyzed:	1/14/03
Dilution Factor	1

Dissolved Metals by ICP - USEPA Method 6010

Analyte	Result (mg/L)	PQL	Flags
Lead	ND	0.01	
Manganese	7.96	0.01	

STL Seattle

Client Name	ESN Northwest, Inc.
Client ID:	MW-3
Lab ID:	111209-03
Date Received:	1/13/03
Date Prepared:	1/14/03
Date Analyzed:	1/14/03
Dilution Factor	1

Dissolved Metals by ICP - USEPA Method 6010

Analyte	Result (mg/L)	PQL	Flags
Lead	ND	0.01	
Manganese	6.46	0.01	

STL Seattle

Client Name	ESN Northwest, Inc.
Client ID:	MW-4
Lab ID:	111209-04
Date Received:	1/13/03
Date Prepared:	1/14/03
Date Analyzed:	1/14/03
Dilution Factor	1

Dissolved Metals by ICP - USEPA Method 6010

Analyte	Result (mg/L)	PQL	Flags
Lead	ND	0.01	
Manganese	5.73	0.01	

STL Seattle

Client Name	ESN Northwest, Inc.
Client ID:	MW-5
Lab ID:	111209-05
Date Received:	1/13/03
Date Prepared:	1/14/03
Date Analyzed:	1/14/03
Dilution Factor	1

Dissolved Metals by ICP - USEPA Method 6010

Analyte	Result (mg/L)	PQL	Flags
Lead	ND	0.01	
Manganese	7.72	0.01	

STL Seattle

Client Name	ESN Northwest, Inc.
Client ID:	MW-6
Lab ID:	111209-06
Date Received:	1/13/03
Date Prepared:	1/14/03
Date Analyzed:	1/14/03
Dilution Factor	1

Dissolved Metals by ICP - USEPA Method 6010

Analyte	Result (mg/L)	PQL	Flags
Lead	ND	0.01	
Manganese	9.56	0.01	

STL Seattle

Lab ID:	Method Blank - DP216
Date Received:	-
Date Prepared:	1/14/03
Date Analyzed:	1/14/03
Dilution Factor	1

Dissolved Metals by ICP - USEPA Method 6010

Analyte	Result (mg/L)	PQL	Flags
Lead	ND	0.01	
Manganese	ND	0.01	

STL Seattle

Client Name	0
Client ID:	
Lab ID:	SDP216
Date Received:	-
Date Prepared:	1/14/03
Date Analyzed:	1/14/03
Dilution Factor	1

Dissolved Metals by ICP - USEPA Method 6010

Analyte	Result (mg/L)	PQL	Flags
Lead	1.02	0.01	
Manganese	1	0.01	

STL Seattle

Client Name	ESN Northwest, Inc.
Client ID:	MW-1 - ms
Lab ID:	111209S01
Date Received:	1/13/03
Date Prepared:	1/14/03
Date Analyzed:	1/14/03
Dilution Factor	1

Dissolved Metals by ICP - USEPA Method 6010

Analyte	Result (mg/L)	PQL	Flags
Lead	0.919	0.01	
Manganese	11	0.01	

STL Seattle

Client Name	ESN Northwest, Inc.
Client ID:	MW-1 - dup
Lab ID:	111209R01
Date Received:	-
Date Prepared:	1/14/03
Date Analyzed:	1/14/03
Dilution Factor	1

Dissolved Metals by ICP - USEPA Method 6010

Analyte	Result (mg/L)	PQL	Flags
Lead	ND	0.01	
Manganese	10.4	0.01	

SEVERN TRENT STL

STL Seattle
5755 8th Street East
Tacoma, WA 98424

Tel: 253 922 2310
Fax: 253 922 5047
www.stl-inc.com

DATA QUALIFIERS AND ABBREVIATIONS

B1: This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).

B2: This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).

C1: Second column confirmation was performed. The relative percent difference value (RPD) between the results on the two columns was evaluated and determined to be $\leq$ 40%.

C2: Second column confirmation was performed. The RPD between the results on the two columns was evaluated and determined to be > 40%. The higher result was reported unless anomalies were noted.

M: GC/MS confirmation was performed. The result derived from the original analysis was reported.

D: The reported result for this analyte was calculated based on a secondary dilution factor.

E: The concentration of this analyte exceeded the instrument calibration range and should be considered an estimated quantity.

J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.

MCL: Maximum Contaminant Level

MDL: Method Detection Limit

N: See analytical narrative.

ND: Not Detected

PQL: Practical Quantitation Limit

X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____ .

X2: Contaminant does not appear to be "typical" product.

X3: Identification and quantitation of the analyte or surrogate was complicated by matrix interference.

X4: RPD for duplicates was outside advisory QC limits. The sample was re-analyzed with similar results. The sample matrix may be nonhomogeneous.

X4a: RPD for duplicates outside advisory QC limits due to analyte concentration near the method practical quantitation limit/detection limit.

X5: Matrix spike recovery was not determined due to the required dilution.

X6: Recovery and/or RPD values for matrix spike(/matrix spike duplicate) outside advisory QC limits. Sample was re-analyzed with similar results.

X7: Recovery and/or RPD values for matrix spike(/matrix spike duplicate) outside advisory QC limits. Matrix interference may be indicated based on acceptable blank spike recovery and/or RPD.

X7a: Recovery and/or RPD values for this spiked analyte outside advisory QC limits due to high concentration of the analyte in the original sample.

X8: Surrogate recovery was not determined due to the required dilution.

X9: Surrogate recovery outside advisory QC limits due to matrix interference.

111209

TRANSGLOBAL ENVIRONMENTAL GEOSCIENCES

CHAIN-OF-CUSTODY RE

ESN

DATE: 1-13-03 PAGE 1 OF

PROJECT NAME: Grenly-Stewart

0-459-4670 FAX: 360-459-3432

LOCATION:

JECT #: PROJECT MANAGER:

COLLECTOR: DATE OF COLLEC

ber	Depth	Time	Sample Type	Container Type	VOA 8010/8021B	VOA 8021B BTEX	VOA 8260	SEMI VOL 8270	TPH - HCID	TPH 8015 (gasoline)	TPH 8015 (diesel)	TPH 8015 (d & o)	PAH 8100	PCBs 8082	Pesticides 8081	TOTAL LEAD	pH	Diss. Manganese	~~Diss. Ferrous Iron~~	Diss. Pb				NOTES
			H2O	500 ml Poly														X	X	X				
			↓	↓														X	X	X				
																		X	X	X				
																		X	X	X				
																		X	X	X				
																		X	X	X				

* Metals bottles ... but bottle was ... that states diss... DO NOT AN... for Iron (... Dean on

(Signature)	DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
	1-12-02 / 1215	[signature]	1/13/03
(Signature)	**DATE/TIME**	**RECEIVED BY (Signature)**	**DATE/TIME**

SAMPLE DISPOSAL INSTRUCTIONS

☐ TEG DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

LABORATORY NOTES: Please Filter Low levels

Turn Around Time: Std