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14 July 1993

01-0817-05-1964-009

Mr. Brian Sato, P.E.
Project Manager
Washington Department of Ecology
3190 - 160th Avenue S.E.
Bellevue, Washington 98008

RECEIVED

JUL 16 1993

DEPT. OF ECOLOGY

Subject: Work Assignment #60 - Monterey Apartments, Seattle
Task II - Construction Oversight
Groundwater Monitoring Report

Dear Mr. Sato:

Enclosed is the Groundwater Monitoring Report for the sampling conducted on 7 July at the Monterey Apartments project site. The purpose of the monitoring event was to establish baseline groundwater quality prior to actual process startup. This will give us a point of reference to determine progress toward cleanup objectives.

I have enclosed a business card from Patricia Magnuson. She is the Metro Industrial Waste Investigator handling the Monterey Permit Application. I suggest you give her a call, introduce yourself, and explain to her what has happened with the remedial system. Recall our conversation last week wherein I informed you of the S.A.V.E. unit engine failure. I have not spoken with either Glacier Environmental nor RSI (the S.A.V.E. supplier) to determine the timing for the next steps toward repair and recommissioning.

I have also enclosed a SAIC Client Assessment form. At your convenience I would appreciate you completing the questionnaire and forwarding it to the address on the form. Over the time frame of my involvement on this project, I have tried to resolve some of your earlier concerns about communications and I trust we have performed to your satisfaction.

Please feel free to call me if you have questions.

Very truly yours,

Douglas N. Pearman
Assistant Vice President

enclosure

cc: B. Morson, SAIC
G. Bowen, SAIC
M. Hayes, SAIC
Chuck Hinds, Ecology

BASELINE GROUNDWATER MONITORING REPORT MONTEREY APARTMENTS

On July 7, 1993 Matt Hayes and Brett Freier collected four groundwater samples from a combination of groundwater monitoring and recovery wells at the Monterey Apartments site. The purpose of collecting these samples was to establish baseline groundwater contaminant concentrations prior to the startup and operation of the SAVE remedial system.

The sampling procedures used for samples collected from monitoring wells were as follows:

- Upon opening of the well monument, total organic vapor concentrations were measured using an HNu Photoionization Detector. Measurements were taken for the breathing zone (for health and safety monitoring) and from within the well casing ("downhole"). Measurements were recorded in the field logbook.
- Wells were allowed to vent for 15 minutes to 3 hours prior to sampling to minimize any potential for exposure to organic vapors and to allow work to continue in EPA Level D personnel protective attire (did not want to alarm local residents by conducting sampling in full-face respirators).
- Using a product interface probe/water level indicator, the depth to product (if present) or groundwater was measured. The total well depth was also measured so that required purge volumes could be calculated. If product was discovered, the apparent product thickness was also measured. Due to capillary and surface tension forces, the apparent thickness measurement may not be representative of the actual product thickness in the aquifer.
- Using 1-inch, disposable PVC bailers, the monitoring well was purged prior to sampling. Using the water level measurements taken earlier, a well volume was calculated. A total of three well volumes were removed to ensure water from the aquifer was collected.
- After purging, the sample was collected by pouring water from the bailer directly into pre-preserved sampling containers. For BETX or WTPH-G analyses, glass vials were filled to exclude air or vapor (i.e. zero head space).

For the sample from RW-4 (the recovery well in the deli parking lot), the sample was collected from the in-line composite sampling port located after the groundwater manifold and ahead of the separator tank. Well RW-4 was the only well pumping at the time of sample collection. More than three well volumes had already been purged due to fairly continuous pumping throughout the day. Samples were collected by placing the sampling container under the spigot and allowing water to flow into the sampling container.

Table 1 presents a summary of samples collected. Completed sampling activities differed from the proposed scope of work for the following reasons:

- Recovery wells RW-3 and RW-5 had been pumped dry (or the groundwater level has dropped below the pumping level); no samples could be collected.
- The groundwater treatment system failed (possibly failure of the head gasket in the internal combustion engine). With the SAVE system inoperable, it was not possible to

collect a treated effluent sample. The sample from RW-4, although collected from the influent sampling port, should not be considered an influent sample for permitting reasons. Metro will require influent and effluent sampling to be representative of actual treatment conditions.

- Except for the sample from RW-4, TPH was not measured, rather WTPH-G was measured. This parameter will yield more interpretive information concerning migration of product and likelihood to produce potentially harmful vapors.

A trip blank sample was submitted for quality assurance. Equipment blank samples were not necessary as all sampling equipment was used only once than discarded as solid waste. Field blank samples are not normally collected during routine operation and maintenance sampling activities due to expense.

Attachment A contains the laboratory results sheets submitted by Laucks Testing Laboratories.

DATA RESULTS AND DISCUSSION

Table 2 presents hydrologic and vapor monitoring data collected. Piezometric surfaces should not be plotted from this data for two reasons:

- The data are referenced to ground surface or to the top of the well casings, not a standard reference point. Until all the wells are surveyed (preferably relative to mean sea level or a similar reference), it will not be possible to develop accurate piezometric surfaces.
- At the time of measurement, the recovery wells had been pumped or were being pumped. This probably has significantly changed the perceived depth to groundwater by creating cones of depression in and around the recovery wells.

Sampling locations are shown in the attached construction drawing. Table 3 presents the analytical results for the samples collected. These results can be compared to two different sets of regulatory limits, Metro (permit requirements) and MTCA Method A. The Metro limits shown are for grab samples (not daily averages). Sample PROC-I was the only process sample collected, thus single grab sample limits apply.

For inorganic parameters, the groundwater influent meets the Metro criteria (by more than an order of magnitude). Metals treatment prior to discharge is not necessary. It may be possible to petition Metro to delete these parameters from future sampling events based on historical and current groundwater data (groundwater concentrations of these parameters at this site have never exceeded Metro permit limits).

The Method A standards for chromium and lead are 50 and 5 $\mu\text{g/L}$ respectively. The lead standard was exceeded in the sample PROC-I (recovery well RW-4).

For the organic compounds, Metro limits were exceeded for benzene and toluene. If a 98% (or greater) removal efficiency is achieved through the SAVE unit, benzene will be lowered to 130 $\mu\text{g/L}$ or less, the acceptable discharge limit for Metro. Toluene will require a 54% or better removal efficiency to meet Metro standards. These figures are based on the groundwater sample from RW-4 only, the well with the highest concentrations of these constituents.

MTCA Method A limits were exceeded for all BTEX and WTPH-gas in samples PROC-I (RW-4), VP-7, and VP-8. MW-10, the "upgradient" well, had concentrations of benzene and xylenes exceeding MTCA standards only.

18T AVENUE WEST

WEST ROY STREET

QUEEN ANNE AVENUE NORTH

DEL ROY APARTMENTS

REMEDIAL SYSTEM EQUIPMENT
LAYOUT (UNDER CANOPY),
SEE PLAN1
4

RETAINING WALL

ASPHALT

1
5 HORIZONTAL EXTRACTION
SCREENS, SEE PLAN

CONCRETE

ASPHALT

CONCRETE

EXPRESS

STORAGE

RETAINING WALL

LINDBERG APARTMENTS

MONTEREY APARTMENTS

SYSTEM DISCHARGE LINE
ALIGNMENT TO AVOID
ABANDONED UST

PARKING

ASPHALT SURFACE

PARKING

ALVENA VISTA APARTMENTS

LEGEND**NEW CONSTRUCTION**

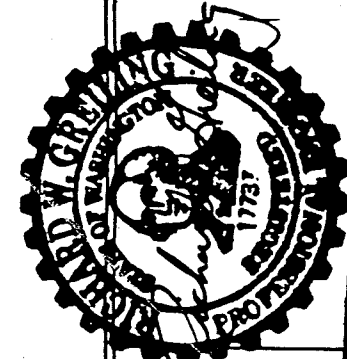
- LIMITS OF CONSTRUCTION
- ⊙ RECOVERY WELL, SEE DETAIL
- R --- GROUNDWATER RECOVERY PIPING,
SEE DRAWING NUMBER 7 of 10.
- VAPOR EXTRACTION PORT, SEE DETAIL
- ⊠ VAPOR EXTRACTION PIPING CONNECTION
TO EXIST. MONITORING WELL,
SEE DETAIL
- V --- VAPOR EXTRACTION PIPING,
SEE PROFILE
- +++ V +++ VAPOR EXTRACTION SCREEN
- △ --- SD --- SYSTEM DISCHARGE PIPING,
SEE PROFILE

NOTES:

1. NOTIFY LOCAL UTILITY OPERATORS TO LOCATE ALL UTILITIES BEFORE STARTING ANY SUBSURFACE CONSTRUCTION.
2. ALL FENCE DISTURBED DURING CONSTRUCTION IS TO BE REPLACED.
3. CONTRACTOR SHOULD PROVIDE VAPOR EXTRACTION SYSTEM FOR DIESEL TANK PIT, SHOWN ON ALL DRAWINGS IN GREEN, AS A SEPARATE BID ITEM. (OPTIONAL CONSTRUCTION ITEM)

1 RECOVERY SYSTEM PLAN

2

0 20 40
SCALE IN FEETRECOVERY SYSTEM
CONSTRUCTION PLANMONTEREY APARTMENTS
SEATTLE, WASHINGTON

DATE: MARCH 5, 1998

DRAWING
NUMBER: 3 of 10

An Engineering-Construction Company

PROJECT NUMBER: 8751.013

REV. NO.	REVISION DESCRIPTION	DESIGNED BY	CHECKED BY	DATE
1	ORIGINAL DRAWING	DLH	MDR	12/19/97
2	EDITS	DLH	MDR	12/19/97
3	SYSTEM DISCHARGE	DLH	MDR	03/05/98

ATTACHMENT A
LABORATORY RESULTS SHEETS

Laucks

Testing Laboratories, Inc.

940 S. Harney St.

Seattle, WA 98108

(206) 767-5060 FAX (206) 767-5063

Lab Results FAX Cover Sheet

Company: SAIC FAX number: (700) 943-1331
Attention: Brett Friesen Date: 7/8/1993
From: Charlene Day Time: 2:50
Sent by: CD

Attached results are for Laucks' work order 9307205

These results should be considered preliminary; hardcopy final results to follow by mail.

<u>Client ID</u>	<u>LTL ID</u>	<u>CR Result</u>	<u>Pb Result</u>
MW-10	9307205-01	1.0 u ug/L	8.0 ug/L
VP-8	-02	3.0	8.0
VP-7	-03	4.0	8.0
Proc-I	-04	4.0	45.

This FAX contains pages, including this cover page.

- ☐ A change order request form is attached. Please complete and return to us by FAX to authorize additional lab testing.

The computers have been down all day today, so I'm sending you results the old-fashioned way - pen and paper.

Lab Sample ID : 9307205-01
Client Sample ID: MW-10

Date Collected: 07/07/93
Date Received : 07/07/93

----- WTPH-6 -----

Preparation Date: 07/07/93
Analysis Date : 07/07/93

GC Method: Purge and trap GC

	Result		SDL	
Gasoline Range.....	380		250	ug/L
Benzene.....	13		5.0	ug/L
Toluene.....	5.0	U	5.0	ug/L
Total Xylenes.....	24		7.5	ug/L
Ethyl Benzene.....	11		5.0	ug/L

Surrogate recoveries	% Rec	LCL	UCL
Trifluorotoluene	97.0	50	150
Bromofluorobenzene	98.0	50	150

Lab Sample ID : 9307205-02
Client Sample ID: VF-8

Date Collected: 07/07/93
Date Received : 07/07/93

----- WTPH-G -----

Preparation Date: 07/07/93
Analysis Date : 07/07/93

GC Method: Purge and trap GC

	Result		SDL	
Gasoline Range.....	7000	D	1200	ug/L
Benzene.....	220		5.0	ug/L
Toluene.....	210		5.0	ug/L
Total Xylenes.....	480		7.5	ug/L
Ethyl Benzene.....	61		5.0	ug/L

Surrogate recoveries	% Rec	LOL	UCL
Trifluorotoluene	115	50	150
Bromofluorobenzene	108	50	150

Lab Sample ID : 9307205-03
Client Sample ID: VP-7

Date Collected: 07/07/93
Date Received : 07/07/93

----- WTPH-G -----

Preparation Date: 07/08/93
Analysis Date : 07/08/93

GC Method: Purge and trap GC

	Result		SDL	
Gasoline Range.....	20000	D	2500	ug/L
Benzene.....	4700	D	50	ug/L
Toluene.....	2000	D	50	ug/L
Total Xylenes.....	3600	D	75	ug/L
Ethyl Benzene.....	910	D	50	ug/L

Surrogate recoveries	% Rec	LCL	UCL
Trifluorotoluene	104	50	150
Bromofluorobenzene	95.0	50	150

Lab Sample ID : 9307205-04
Client Sample ID: PROC-1

Date Collected: 07/07/93
Date Received : 07/07/93

----- WTPH-G -----

Preparation Date: 07/08/93
Analysis Date : 07/08/93

GC Method: Purge and trap GC

	Result		SDL	
Gasoline Range.....	14000	D	2500	ug/L
Benzene.....	6500	D	50	ug/L
Toluene.....	2800	D	50	ug/L
Total Xylenes.....	2000	D	75	ug/L
Ethyl Benzene.....	370	D	50	ug/L

Surrogate recoveries	% Rec	LCL	UCL
Trifluorotoluene	88.0	50	150
Bromofluorobenzene	88.0	50	150

Lab Sample ID : 9307205-05
Client Sample ID: Trip Blank

Date Collected: 07/07/93
Date Received : 07/07/93

----- WTPH-G -----

Preparation Date: 07/07/93
Analysis Date : 07/07/93

GC Method: Purge and trap GC

	Result		SDL	
Gasoline Range.....	250	U	250	ug/L
Benzene.....	5.0	U	5.0	ug/L
Toluene.....	5.0	U	5.0	ug/L
Total Xylenes.....	7.5	U	7.5	ug/L
Ethyl Benzene.....	5.0	U	5.0	ug/L

Surrogate recoveries	% Rec	LCL	UCL
Trifluorotoluene	92.0	50	150
Bromofluorobenzene	95.0	50	150

Table 1
Groundwater Sampling Summary

Well ID	Location	Sample No.	Sample Time	Analysis
MW-10	NE Sidewalk of Deli Lot	MW-10	1300	BTEX, WTPH-G, Cr, Pb
VP-7	NW Corner of Monterey Lot	VP-7	1430	BTEX, WTPH-G, Cr, Pb
VP-8	NE Corner of Monterey Lot	VP-8	1415	BTEX, WTPH-G, Cr, Pb
RW-4	W side of Deli Lot	PROC-I	1505	BTEX, WTPH-G, Cr, Pb, TPH

Table 2
Hydrologic and Vapor Monitoring Data

Well No.	Time	Static H ₂ O (ft BTC)	Total Depth (ft BTC)	Ht. of H ₂ O (ft)	DH HNu (ppm)
MW-6	0935	22.30 ¹	28.34	6.04 ¹	120
MW-9	0945	20.11	28.07	7.96	60
MW-10	0950	13.81	29.26	15.45	105
RW-2	1010	11.71	21.52	9.81	260
RW-3 ³	1030	16.14	18.52	2.38	52 ²
RW-4 ⁴	1130	21.65	32.42	10.77	260
RW-5 ⁵	1015	12.34	14.47	2.13	2 ²
VP-3	1100	no water	9.73	0	120
VP-5	1115	12.29	16.47	4.18	> 200
VP-7	1120	10.46	17.40	6.94	NM
VP-8	1110	12.23	17.99	5.76	460

DH = Downhole BTC = Below Top of Casing NM = Not Measured

¹ Depth to product was 20.70, yielding an apparent product thickness of 1.6 feet. Due to capillary and surface tension forces, the actual product thickness is probably less. The water column calculation does not include the apparent product thickness.

² Measurement taken after well had vented for at least 15 minutes.

³ Water level measurement was taken with the pump in the well. The top of the pump is located at approximately 14.9 feet BTC.

⁴ Water level measurement was taken with the pump in the well and referenced to the top of the manhole, not to the top of the well casing (due to high organic vapors in the manhole). A downhole measurement was not collected for health and safety reasons.

⁵ Water level measurement was taken with the pump in the well. The top of the pump is located at approximately 11.11 feet BTC.

The HNu was swamped at VP-5 (>200) and did not recover adequately to allow continued use. The measurement at VP-7 could not be taken.

Table 3
Analytical Results
($\mu\text{g/L}$)

Analyte	MW-10	PROC-I (RW-4)	VP-7	VP-8	Trip Blank	Metro Limit	MTCA Method A Limit
Total Chromium	1.0 U	4.0	4.0	3.0	NM	500	50
Total Lead	8.0	45	8.0	8.0	NM	400	5
Benzene	13	6,500	4,700	220	5.0 U	130	5
Ethylbenzene	11	370	910	61	5.0 U	1,400	30
Toluene	5.0 U	2,800	2,000	210	5.0 U	1,500	40
Total Xylenes	24	2,000	3,600	480	7.5 U	NA	20
WTPH-G	380	14,000	20,000	7000	250 U	100,000 ¹	1,000

¹ The Metro limit is actually stated for nonpolar fats, oils, and greases. Total petroleum hydrocarbons will be substituted for this parameter.

CLIENT ASSESSMENT OF SAIC'S PERFORMANCE

Contract Name:

Interviewer:

Task:

Date:

Performance Item	Our Organization's Expectations Were:				Comment
	Always Exceeded	Frequently Exceeded	Met	Not Met	
1. Technical Quality of Work					
2. Value					
3. Use of Innovative Concepts or Devices					
4. Timeliness of Reports and Submissions					
5. Adherence to Budget					
6. Good Communication/Relationship with SAIC Staff					
7. Administrative Support, including Invoicing, Contract Administration					

8. Other Issues and Comments
(Please specify)

9. If the need arises in the future, will your organization engage SAIC for further environmental projects?
Yes _____ No _____ Depends Upon: _____

10. How would you rate SAIC against other Contractors conducting similar work (on a scale of 1 to 10, with 10 being the most positive rating)?

Return to: Mr. Alvin Alm, Senior Vice President, SAIC, 1710 Goodridge Drive, McLean, VA 22102

AT SAIC, QUALITY IS MEASURED BY CUSTOMER SATISFACTION