PORT OF OAKLAND

August 21, 1998

Mr. Larry Seto
Senior Hazardous Materials Specialist
Alameda County Environmental Protection (LOP)
1131 Harbor Bay Parkway, Room 250
Alameda, CA 94502-6577

SUBJECT: GROUNDWATER MONITORING AND SAMPLING REPORT
2277 7TH STREET, OAKLAND
STID # 3899

Dear Mr. Seto:

Please find enclosed a copy of the *Groundwater Monitoring, Sampling and Product Removal System O&M Report, 2277 Seventh Street, Oakland, California,* prepared on the behalf of the Port of Oakland by Innovative Technical Solutions, Inc. (ITSI). The report, dated July 21, 1998, addresses groundwater monitoring and sampling and product recovery activities that were performed by ITSI at Building C-401, 2277 7th Street, Oakland, California.

If you have any questions, please feel free to contact me at 272-1373.

Sincerely,

John Prall, R.G.
Associate Environmental Scientist

Enclosure

cc: Neil Werner

530 Water Street ■ Jack London Square ■ P.O. Box 2064 ■ Oakland, California 94604-2064
Telephone (510) 272-1100 ■ Fax (510) 272-1172 ■ TDD (510) 763-5703 ■ Cable address, PORTOFOAK, Oakland

INNOVATIVE TECHNICAL SOLUTIONS, Inc.

ITSI

July 21, 1998

Project No. 95-113.49

Mr. John Prall
Associate Environmental Scientist
Port of Oakland
530 Water Street
Oakland, California 94607

Groundwater Monitoring, Sampling and Product Removal System O&M Report
2277 Seventh Street
Oakland, California

Dear Mr. Prall:

This Groundwater Monitoring, Sampling and Product Removal System O&M Report (Report) has been prepared by Innovative Technical Solutions, Inc. (ITSI) on behalf of the Port of Oakland for groundwater monitoring and sampling performed on April 13, 1998, and operations and maintenance (O&M) of the product removal system on April 13, May 13, May 24, and June 15, 1998 at the 2277 Seventh Street site in Oakland, California. A site location map is shown on Figure 1.

The scope of work included monitoring and/or sampling five groundwater monitoring wells, MW-2, MW-4, MW-5, MW-7, and MW-8 and O & M of the product removal system on monitoring wells MW-1, MW-3, and MW-6. The monitoring wells were installed at the site to assess groundwater quality following the removal of underground storage tanks (USTs) from the site in September 1993. The former USTs consisted of two 10,000-gallon gasoline tanks (CF-17 and CF-18), one 500-gallon oil tank (CF-19), and one 300-gallon waste oil tank (CF-20).

1330 Broadway, Suite 1625, Oakland, CA 94612 (510) 286-8888 (510) 286-8889 fax

MONITORING AND SAMPLING OF MONITORING WELLS

The groundwater monitoring and sampling was performed on April 13, 1998. Monitoring wells MW-1, MW-3, and MW-6 contain product skimmers, and were thus not included in the groundwater monitoring and sampling program. The remaining monitoring wells were initially gauged for depth to water and checked for the presence of separate-phase hydrocarbons. Separate-phase hydrocarbons were observed in monitoring well MW-8, as noted in Table 1. The depth to product and depth to water measurements were recorded on Monitoring Well Purge and Sample Forms. Copies of the Forms are provided in Attachment A.

After the depth to water measurements were recorded, the monitoring wells not containing separate phase hydrocarbons were purged using a peristaltic pump. Approximately three casing volumes of water were removed, until pH, conductivity, and temperature readings stabilized. Field parameters were recorded on the Monitoring Well Purge and Sample Forms.

Groundwater samples were collected from the monitoring wells using the peristaltic pump and transferred into laboratory provided containers. The sample containers were properly labeled with the sample number, date and time of collection, and samplers' initials, and were placed on ice in an insulated cooler. Purge water was placed in a properly labeled drum and stored inside the product recovery compound.

MONITORING WELL GROUNDWATER LEVELS

Depth to water data is summarized in Table 1. The groundwater elevations were calculated using the measured depth to water and survey elevation of top of casing (relative to the Port of Oakland datum) provided in Table 1. The local groundwater flow direction is shown in Figure 2, and is to the north-northeast.

LABORATORY ANALYSIS OF GROUNDWATER SAMPLES

The samples were sent under chain-of-custody procedures to Curtis and Tompkins, Ltd. in Berkeley, California. The samples were analyzed using standard methodology for the following:

- TPH as gasoline (TPHg) by Modified EPA Method 8015.
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8020A.
- TPH as diesel (TPHd) by Modified EPA Method 8015 with silica gel cleanup procedure.

- TPH as motor oil (TPHmo) by EPA Method 8015 with silica gel cleanup procedure.

The laboratory results for the groundwater samples are summarized in Table 2, and are shown in Figure 2. Copies of the laboratory results and chain-of-custody are provided in Attachment B.

FINDINGS

Results of the April 13, 1998 groundwater monitoring and sampling are summarized below:

- Separate-phase hydrocarbons were observed in monitoring well MW-8.
- TPHg was reported at a concentration of 150 µg/l in MW-4, and was reportedly non-detect in MW-2, MW-5 and MW-7.
- Benzene was reported at a concentration of 520 µg/l in MW-4 and was reportedly non-detect in MW-2, MW-5 and MW-7.
- Toluene was reported at a concentration of 2.9 µg/l in MW-4, and was reportedly non-detect in MW-2, MW-5 and MW-7.
- Ethylbenzene and xylenes were reportedly non-detect in the samples collected.
- TPHd and TPHmo were reportedly non-detect in the samples collected.

PRODUCT REMOVAL SYSTEM O&M

The product removal system was inspected monthly. The inspections consist of the removal of product accumulated in passive skimmers in MW-1 and MW-6, and an inspection of the operational status of the active skimmer system installed in MW-3.

The volume of product recovered from the two passive skimmers and one active skimmer system is shown in Table 1. The status of the active skimmer system during the monthly inspections is summarized below:

Date	System Status	Comments
12/30/97	Up	Verified system status. No access to control box.
1/29/98	Down	Air supply line was partially closed. Air line was reset to full open position, and system was restarted. No access to control box.
3/2/98	Down	Air compressor was down (possibly due to excess water in control panel). Air compressor was restarted. Obtained access to control box. Tank full indicator had been triggered, and was reset. System restarted. Tested shut-off switches and checked filters. Pulled active skimmer, untangled discharge line, increasing purge volume from approximately 10 ml/cycle to 30-40 ml/cycle.

Date	System Status	Comments
4/13/98	Up	Verified system status. System fully operational. CEE onsite to service active skimmer pump in MW-3 to improve recovery rate. Replace exhaust line, replace hydrophilic screen, and adjust pump cycle rate.
4/24/98	Up	Verified system status. System fully operational. Product level in tank near capacity. Shut down system until tank contents removed on 4/27. Restarted system on 4/28.
5/11/98	Up	Verified system status. System fully operational.
6/15/98	Up	Verified system status. System fully operational.

Add for Jim Schollard on 9-23-98.

The active skimmer system was removed and serviced on April 13-14, 1998 to increase the pumping rate and restore product recovery rate to original design capacity. This resulted in a significant increase in the rate of product recovery by the system. Approximately 3,670 gallons of product was recovered from the onsite holding tank by the Port of Oakland disposal contractor during the period of April 27 through June 30, 1998.

9-23-98 Left Jim Schollard a message that part of a sentence was lost from page 3 to page 4. Asked him to get back to me.

Please call us if you have any questions or comments.

Sincerely,

Jim Schollard
Environmental Scientist

Jeffrey D. Hess, R.G.
Project Director

Attachments

Table 1

Groundwater Elevations and Product Removal Data
2277 7th Street
Oakland, California

Well ID	Elevation of Top of Casing[1] (feet)	Date of Monitoring	Depth to Free Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Groundwater Elevation (feet)	Estimated Product Removed (gallons)	Product Removal Method
MW-1	14.14	12/31/97	-	-	-	-	0 2	passive skimmer
		1/29/98	-	-	-	-	0.2	passive skimmer
		3/2/98	-	-	-	-	0.018	passive skimmer
		4/13/98	-	-	-	-	-	passive skimmer
		5/11/98	-	-	-	-	0.02	passive skimmer
		6/15/98	-	-	-	-	0.2	passive skimmer
MW-2	14.36	12/31/97	-	8.73	-	5.63	-	-
		4/13/98	-	7.72	-	6.64	-	-
MW-3	14.22	12/31/97	-	-	-	-	30	active skimmer
		1/29/98	-	-	-	-	10	active skimmer
		3/2/98	-	-	-	-	0	active skimmer
		4/13/98	-	-	-	-	240	active skimmer
		5/11/98	-	-	-	-	1,545	active skimmer
		6/15/98	-	-	-	-	1,950	active skimmer
MW-4	13.15	12/31/97	-	7.09	-	6.06	-	-
		4/13/98	-	7.71	-	5.44	-	-
MW-5	13.49	12/31/97	-	6.38	-	7.11	-	-
		4/13/98	-	5.56	-	7.93	-	-
MW-6	14.00	13/31/97	-	-	-	-	0.0014	passive skimmer
		1/29/98	-	-	-	-	0.0014	passive skimmer
		3/2/98	-	-	-	-	0.0014	passive skimmer
		4/13/98	-	-	-	-	-	passive skimmer
		5/11/98	-	-	-	-	-	passive skimmer
		6/15/98	-	-	-	-	-	passive skimmer
MW-7	14.35	12/31/97	-	8.88	-	5.47	-	-
		4/13/98	-	7.86	-	6.49	-	-
MW-8	12.94	12/31/97	8.49	8.82	0.33	4.38[2]	-	-
		4/13/98	8.0	-[3]	-[3]	-[3]	-	-

[1] Elevation data relative to Port of Oakland datum; well surveys performed on September 12, 1996 and February 4, 1998 by PLS Surveys.

[2] Groundwater elevation calculated assuming a specific gravity of 0.8 for free product.

[3] Free product in well desensitized probe, preventing further measurements.

Table 2

Summary of Laboratory Results
2277 7th Street
Oakland, California

Monitoring Well ID	Date	TPHg (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	TPHd (µg/l)	TPHmo (µg/l)	Note
MW-2	5/27/94	87	<0.5	<0.5	<0.5	<0.5	470	NA	1
	3/29/95	<50	<0.4	<0.3	<0.3	<0.4	110	1,400	1
	9/6/95	<50	<0.4	<0.3	<0.3	<0.4	NA	NA	1
	1/8/96	<50	<0.4	<0.3	<0.3	<0.4	<50	1,200	1
	4/4/96	<50	<0.5	<0.5	<0.5	<1.0	160	320	1
	7/10/96	<50	<0.4	<0.3	<0.3	<0.4	120	1,400	1
	12/3/96	<50	<0.5	<0.5	<0.5	<1.0	230[2,3]	<250	1
	3/28/97	<50	<0.5	<0.5	<0.5	<1.0	71[5]	<250	1
	6/13/97	51	<0.5	<0.5	<0.5	<1.0	<50	<250	1
	9/18/97	82	0.56	<0.5	<0.5	<1.0	<50	<250	1
	12/31/97	<50	1.4	<0.5	<0.5	<1.0	<47	<280	
	4/13/98	<50	<0.5	<0.5	<0.5	<1.0	<50	<300	
MW-4	9/11/95	150	23	<0.3	<0.3	<0.4	<200	500	1
	1/8/96	790	170	1.2	0.6	0.6	90	400	1
	4/4/96	1,100	320	1.6	1.1	1.2	180	300	1
	7/10/96	1,200	470	1.5	0.8	0.8	120	300	1
	12/3/96	990	350	3.3	1.3	1.3	220[2,3]	<250	1
	3/28/97	440[3]	190	1.2	0.64	<1.0	<50	<250	1
	6/13/97	1,300	500	5.5	3.4	2.8	92[6]	<250	1
	9/18/97	1,300	550	4.9	2.1	2.0	150	<250	1
	12/31/97	73[2,3,4]	110[2]	1.0[2]	<0.5	<1.0	<47	<280	
	4/13/98	150[3,4]	520	2.9	<2.5	<5.0	<50	<300	
MW-5	9/11/95	90	3.3	<0.3	<0.3	<0.4	<300	2,500	1
	4/4/96	<50	<0.5	<0.5	<0.5	<1.0	180	520	1
	7/10/96	<50	<0.4	<0.3	<0.3	<0.4	120	1,500	1
	12/3/96	<50	<0.5	<0.5	<0.5	<1.0	200[2,3]	<250	1
	3/28/97	<50	<0.5	<0.5	<0.5	<1.0	<50	<250	1
	6/13/97	<50	<0.5	<0.5	<0.5	<1.0	<50	<250	1
	9/18/97	<50	<0.5	<0.5	<0.5	<1.0	<50	<250	1
	12/31/97	<50	<0.5	<0.5	<0.5	<1.0	<47	<280	
	4/13/98	<50	<0.5	<0.5	<0.5	<1.0	<47	<280	

Table 2 (Continued)

Summary of Laboratory Results
2277 7th Street
Oakland, California

Monitoring Well ID	Date	TPHg	Benzene	Toluene	Ethyl-benzene	Xylenes	TPHd	TPHmo	Note
MW-7	9/6/95	<50	<0.4	<0.3	<0.3	<0.4	<300	800	1
	1/8/96	<50	<0.4	<0.3	<0.3	<0.4	410	110	1
	4/4/96	<50	<0.5	<0.5	<0.5	<1.0	530	340	1
	7/10/96	80	<0.4	<0.3	<0.3	<0.4	840	1,700	1
	12/3/96	<50	<0.5	<0.5	<0.5	<1.0	280[2,3]	<250	1
	3/28/97	65[7]	<0.5	<0.5	<0.5	<1.0	94[3]	<250	1
	6/13/97	<50	<0.5	<0.5	<0.5	<1.0	100	<250	1
	9/18/97	<50	<0.5	<0.5	<0.5	<1.0	240	<250	1
	12/31/97	<50	<0.5	<0.5	<0.5	<1.0	53[3,4]	<280	
	4/13/98	<50	<0.5	<0.5	<0.5	<1.0	<48	<290	

1 Data from Table 2, Groundwater Analytical Results, Quarterly Groundwater Monitoring Report: Third Quarter 1997, Building C-401, 2277 7th Street, Oakland, CA, by Uribe and Associates, October 24, 1997.

2 Analyte found in the associated blank as well as in the sample.

3 Hydrocarbons present do not match profile of laboratory standard.

4 Low boiling point/lighter hydrocarbons are present in the sample.

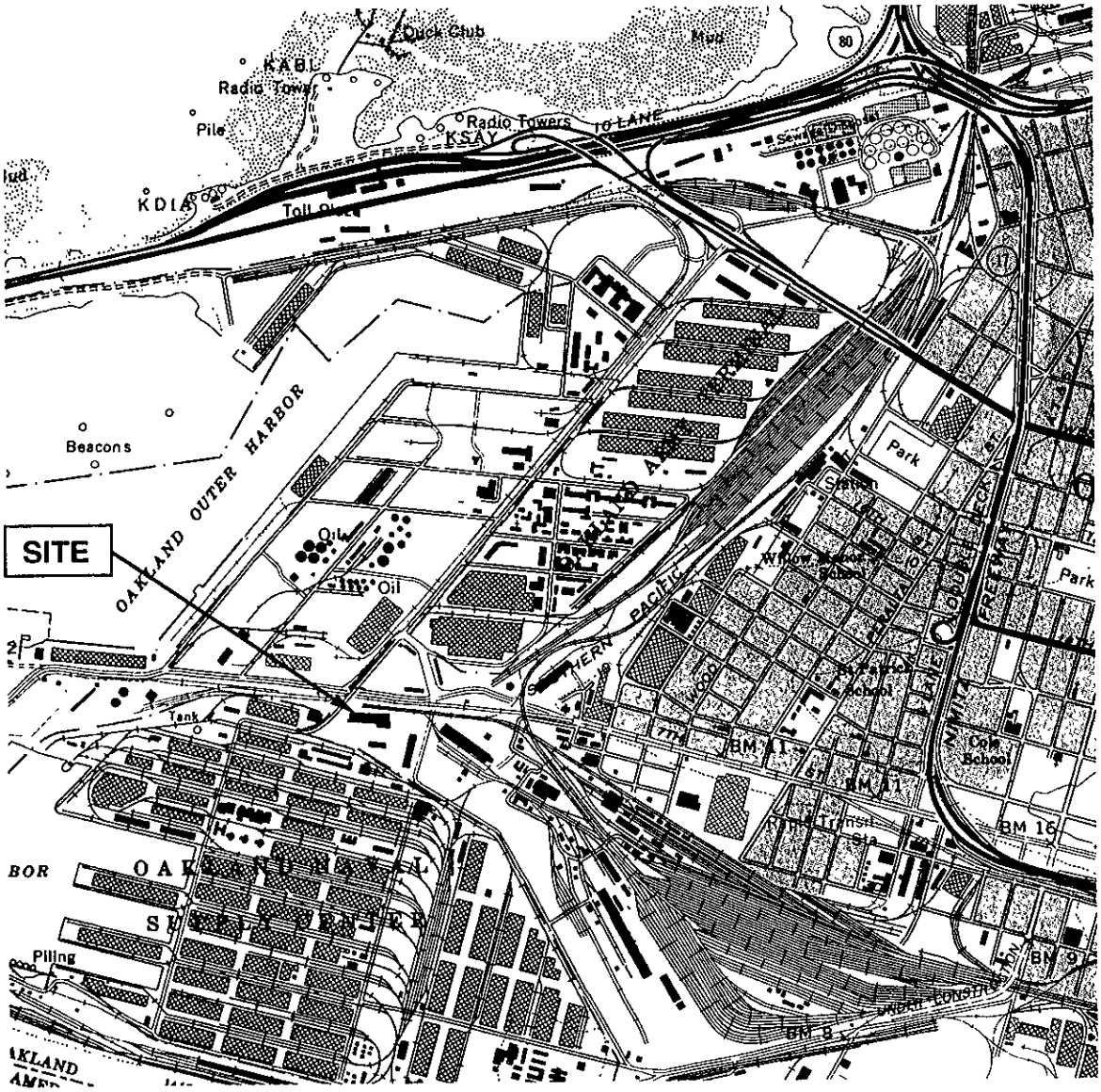
5 Chromatographic pattern matches known laboratory contaminant.

6 Hydrocarbons are present in the requested fuel quantification range, but do not resemble pattern of available fuel standard.

7 High boiling point hydrocarbons are present in sample.

NA Not Analyzed.

95-113 49/F.1-StLoc



0 2,000 Feet 4,000 Feet

Approximate Scale

Source: Oakland West 7.5-minute U.S.G.S. Quadrangle, dated 1959, and photorevised in 1980.

FIGURE 1

SITE LOCATION

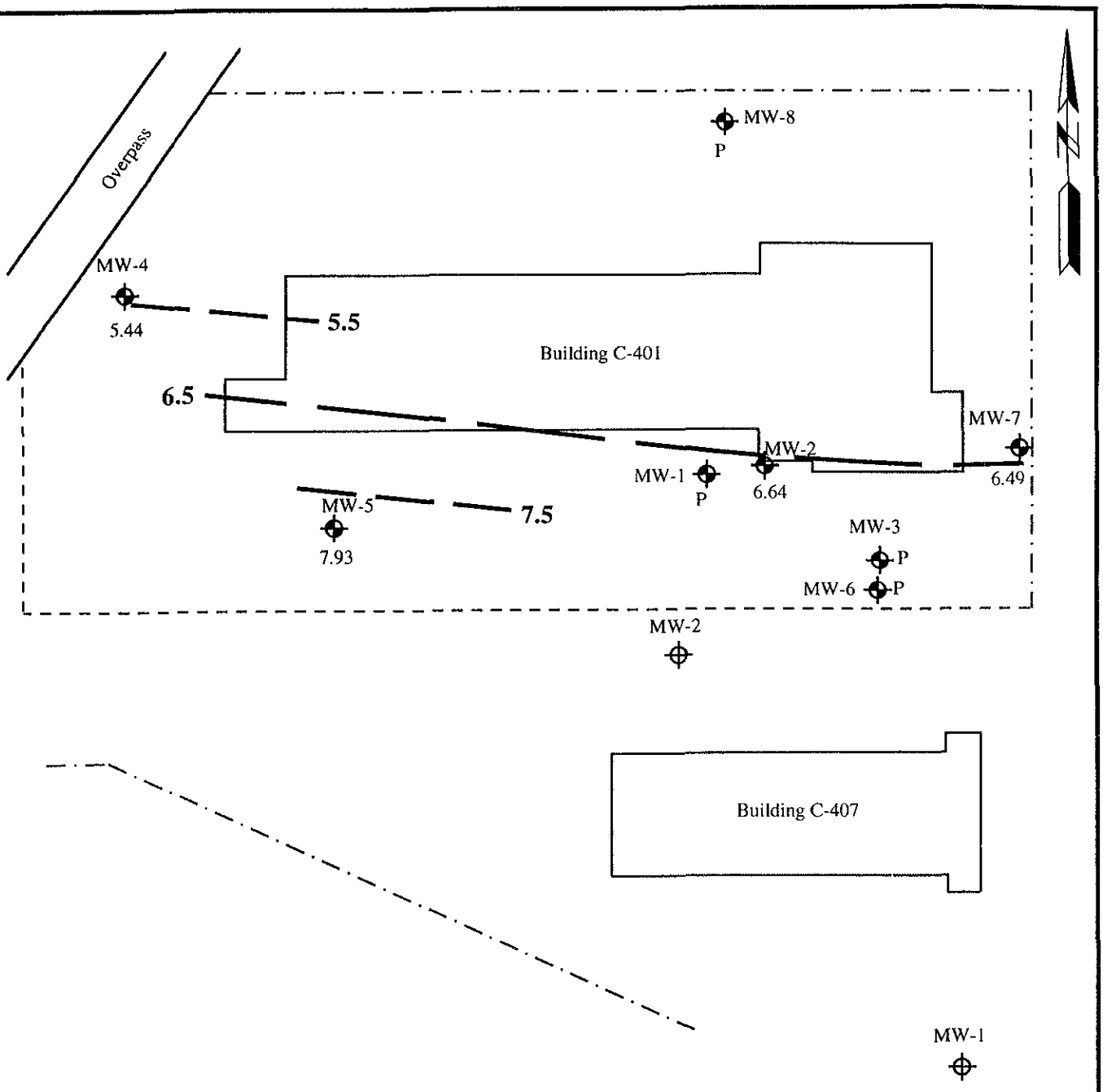
2277 7th Street
Oakland, California

PORT OF OAKLAND

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, INC.

95-113.49/F 2



Legend

- Approximate Location of Monitoring Well
- Approximate Location of Monitoring Well (by others)
- 7.93 Calculated Groundwater Elevation (in feet) on 4/13/98
- Groundwater Elevation Contour Lines
- Fence Line
- Lease Line

0 100 Feet 200 Feet

Approximate Scale

Source: Historical aerial photograph, Port of Oakland.

FIGURE 2

GROUNDWATER ELEVATIONS AND FLOW DIRECTION ON APRIL 13, 1998

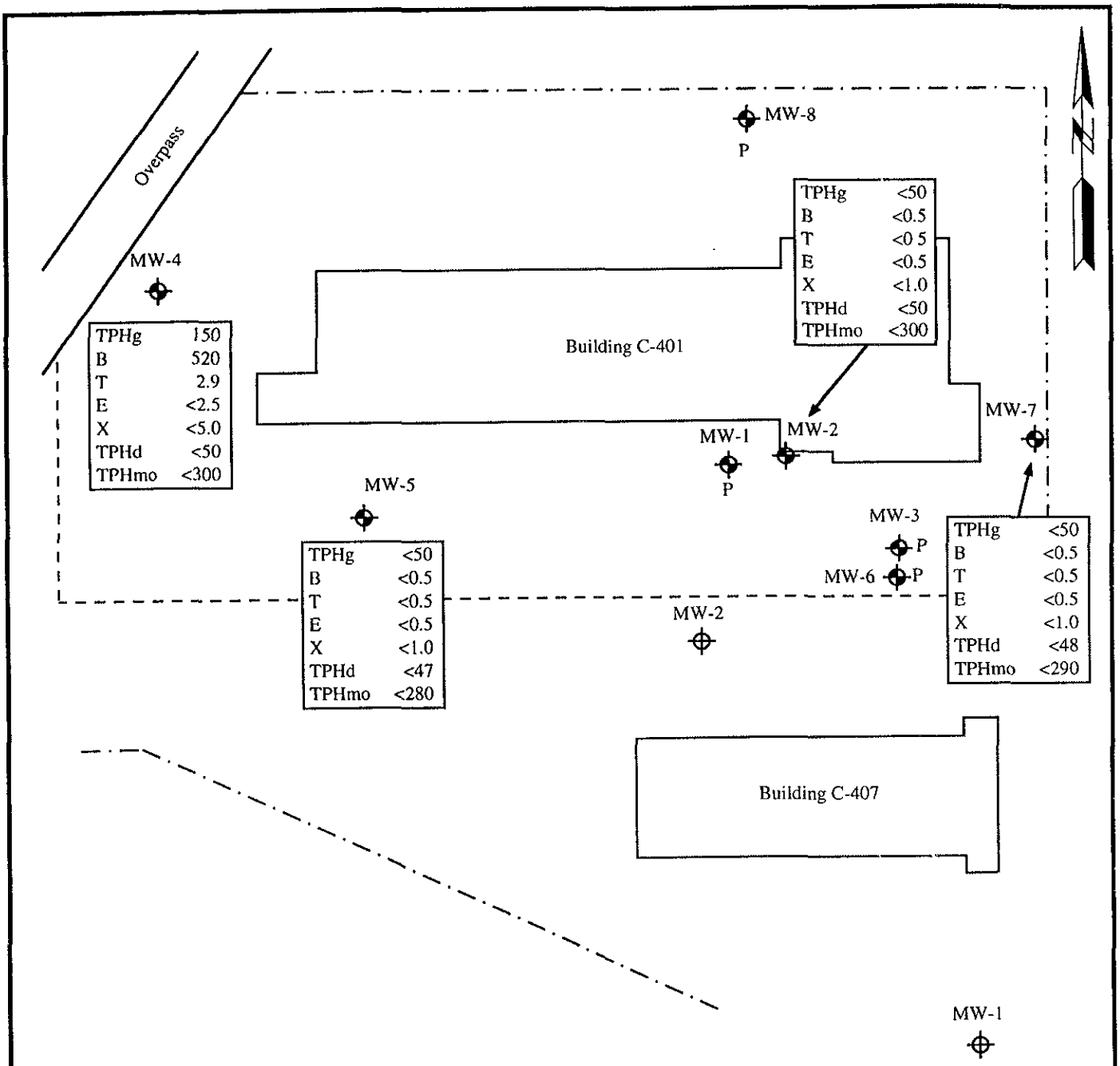
2277 7th Street
Oakland, California

PORT OF OAKLAND

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, INC.

95-113.49/F.2



Legend

- Approximate Location of Monitoring Well
- Approximate Location of Monitoring Well (by others)
- TPHg — TPH as gasoline (in µg/L)
- B — Benzene (in µg/L)
- T — Toluene (in µg/L)
- E — Ethylbenzene (in µg/L)
- X — Total Xylenes (in µg/L)
- TPHd — TPH as diesel (in µg/L)
- TPHmo — TPH as motor oil (in µg/L)
- P — Free Product in Monitoring Well
- Fence Line
- Lease Line

0 100 Feet 200 Feet

Approximate Scale

Source: Historical aerial photograph, Port of Oakland

FIGURE 3

CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER ON APRIL 13, 1998

2277 7th Street
Oakland, California

PORT OF OAKLAND

ITSI
INNOVATIVE TECHNICAL SOLUTIONS, INC.

ATTACHMENT A

COPIES OF MONITORING WELL PURGE AND SAMPLE FORMS

MONITORING WELL PURGE AND SAMPLE FORM

PROJECT NAME: P/O 2277 7th St. PROJECT NO.: 95-113.49

WELL NO.: MW-2 TESTED BY: AF DATE: ~~4/9/98~~ 4/13/98

Measuring Point Description: ~~top of casing~~ Static Water Level (ft.): 7.72 ft

Total Well Depth (ft.): 15.27 Sample Method: peristaltic pump

Water Level Measurement Method: ~~Solinst IP~~ Time Sampled: 1740 / QC1: 1741

Purge Method: ~~peristaltic pump~~ Sample Depth (ft.): ~~>8 ft.~~ 7.72

Time Start Purge: 1712 Field Filtering: N/A

Time End Purge: 1733 Field Preservation: HCl and H_2O

Comments: Collected QC-1 sample ~~at~~ from MW-2

CHECKED BY: J. Schollard

Well Volume Calculation (fill in before purging)	Total Depth (ft)	-	Depth to Water (ft)	=	Water Column (ft)	x	Multiplier for Casing Diameter (in) 2	4	6	=	Casing Volume (gal)
	15.27		7.72		7.55		(0.16)	0.64	1.44		1.21 (3 vols = 3.62)

Time	~~1719~~	1726	1733				
Volume Purged (gal)	~~1.5~~	~~2.6~~ 1.1	~~3.7~~ 1.1				
Cumulative Volume Purged (gal)	~~1.5~~	2.6	3.7				
Cumulative Number of Casing Volumes	1.23	2.14	3.05				
Purge Rate (gpm)	0.21	~~0.37~~ 0.16	0.16				
Temperature (F°) or (C°)	60.6	62.1	62.0				
pH	7.46	7.40	7.39				
Specific Conductivity (µmhos/cm) x 1000	1.47	1.50	1.51				
Dissolved Oxygen (mg/L)	N/A	NA	N/A				
Turbidity/Color (NTU)	clear	clear	cloudy				
Odor	none	none	none				
Dewatered?	No	No	No				

MONITORING WELL PURGE AND SAMPLE FORM

PROJECT NAME: P/O 2277 7th St. PROJECT NO.: 95-113.49

WELL NO.: MW-4 TESTED BY: AF DATE: ~~4/9/98~~ 4/13/98

Measuring Point Description: black Mark on casing TOC Static Water Level (ft.): 7.71

Total Well Depth (ft.): 18.84 Sample Method: peristaltic pump

Water Level Measurement Method: solinst IP Time Sampled: 1635

Purge Method: peristaltic pump Sample Depth (ft.): ~~>8.0 ft.~~ 7.71 ft

Time Start Purge: 1559 Field Filtering: N/A

Time End Purge: 1629 Field Preservation: HCL, water, ice

Comments: Water over TOC. removed prior to removing well cap

CHECKED BY: Jim Scholland

Well Volume Calculation (fill in before purging)	Total Depth (ft)	-	Depth to Water (ft)	=	Water Column (ft)	x	Multiplier for Casing Diameter (in) 2	4	6	=	Casing Volume (gal)
	18.84	-	7.71	=	11.13	x	(0.16)	0.64	1.44	=	1.78 3vols = 5.34

Time	1611	1619	1629				
Volume Purged (gal)	1.8	1.8	1.8				
Cumulative Volume Purged (gal)	1.8	3.6	5.4				
Cumulative Number of Casing Volumes	1	2.02	3.03				
Purge Rate (gpm)	0.15	0.23	0.18				
Temperature (F°) or (C°)	62.4	61.8	62.4				
pH	7.34	7.35	7.36				
Specific Conductivity (µmhos/cm) x 1000	1.18	1.17	1.18				
Dissolved Oxygen (mg/L)	N/A	N/A	N/A				
Turbidity/Color (NTU)	clear	cloudy	clear				
Odor	None	None	None				
Dewatered?	no	no	No				

MONITORING WELL PURGE AND SAMPLE FORM

PROJECT NAME: P/O 2277 7th St. PROJECT NO.: 95-113.49

WELL NO.: MW-5 TESTED BY: M DATE: 4/13/98

Measuring Point Description: blackmarkon TOC

Total Well Depth (ft.): 17.68

Water Level Measurement Method: sl. ist. IP

Purge Method: disposable bailer

Time Start Purge: 1045

Time End Purge: 1052

Static Water Level (ft.): 5.56

Sample Method: disposable bailer

Time Sampled: 1100

Sample Depth (ft.): ≥5.56 ft.

Field Filtering: N/A

Field Preservation: HCl and H2O ice

Comments:

CHECKED BY: Jim Scholland

Well Volume Calculation (fill in before purging)	Total Depth (ft)	-	Depth to Water (ft)	=	Water Column (ft)	x	Multiplier for Casing Diameter (in) 2	4	6	=	Casing Volume (gal)
	17.68		5.56		12.12		(0.16)	0.64	1.44		1.94 3 vols = 5.8

Time	1045	1049	1052				
Volume Purged (gal)	2.0	2.0	2.0				
Cumulative Volume Purged (gal)	2.0	4.0	6.0				
Cumulative Number of Casing Volumes	1.03	2.07	3.11				
Purge Rate (gpm)	2.0	0.5	0.67				
Temperature (F°) or (C°)	71.1	67.2	66.0				
pH	7.02	7.25	7.21				
Specific Conductivity (µmhos/cm)	1.73	2.07	1.93				
Dissolved Oxygen (mg/L)	N/A	N/A	N/A				
Turbidity/Color (NTU)	clear	clear	clear				
Odor	none	None	None				
Dewatered?	No	NO	NO				

MONITORING WELL PURGE AND SAMPLE FORM

PROJECT NAME: P/O 2277 7th St. PROJECT NO.: 95-113.49

WELL NO.: MW-7 TESTED BY: AJ DATE: 4/9/98 4/13/98

Measuring Point Description: blackmark on toc

Total Well Depth (ft.): 18.16

Water Level Measurement Method: ~~Dual Interface~~ Solinist IP

Purge Method: Peristaltic pump

Time Start Purge: 1441

Time End Purge: 1504

Static Water Level (ft.): 7.86

Sample Method: peristaltic pump

Time Sampled: 1504

Sample Depth (ft.): >8.0 ft

Field Filtering: N/A

Field Preservation: HCl, water ice

Comments: water over top of casing - removed prior to removing well cap.

CHECKED BY: Jim Scholland

Well Volume Calculation (fill in before purging)	Total Depth (ft)	-	Depth to Water (ft)	=	Water Column (ft)	x	Multiplier for Casing Diameter (in) 2	4	6	=	Casing Volume (gal)
	18.16	-	7.86	=	10.3	x	0.16	0.64	1.44	=	1.65 (3Vols = 4.9)

Time	1447	1458	1504				
Volume Purged (gal)	1.65	1.65	1.65				
Cumulative Volume Purged (gal)	1.65	3.3	4.95				
Cumulative Number of Casing Volumes	~~1.0~~ 1.0	2	3				
Purge Rate (gpm)	0.27	0.15	0.26				
Temperature (F°) or (C°)	65.9	63.5	63.8				
pH	7.43	7.43	7.42				
Specific Conductivity (µmhos/cm)	1.87	1.62	1.60				
Dissolved Oxygen (mg/L)	N/A	N/A	N/A				
Turbidity/Color (NTU)	clear	clear	clear				
Odor	None	none	none				
Dewatered?	No	no	no				

MONITORING WELL
PURGE AND SAMPLE FORM

PROJECT NAME: 2277 7th St., Oakland PROJECT NO.: 95-113.49

WELL NO.: MW-8 TESTED BY: JS DATE: 4/13/98

Measuring Point Description: T.O.C. Static Water Level (ft.): NM* DTP = 8.0'

Total Well Depth (ft.): NM Sample Method: NA

Water Level Measurement Method: Solinist IP Time Sampled: _____

Purge Method: NA Sample Depth (ft.): _____

Time Start Purge: _____ Field Filtering: _____

Time End Purge: _____ Field Preservation: _____

Comments: Extremely viscous black sticky product in well, *coated probe preventing DTW measurement collection

Well Volume Calculation (fill in before purging)	Total Depth (ft)	-	Depth to Water (ft)	=	Water Column (ft)	x	Multiplier for Casing Diameter (in) 2: 0.16	4: 0.64	6: 1.44	=	Casing Volume (gal)

Time								
Volume Purged (gals)								
Cumulative Volume Purged (gals)			Not sampled due to product in well					
Cumulative Number of Casing Volumes								
Purge Rate (gpm)								
Temperature (F°) or (C°)								
pH								
Specific Conductivity (µmhos/cm)								
Dissolved Oxygen (mg/L)								
Turbidity/Color (NTU)								
Odor								
Dewatered?								

Jim Scholland

CHECKED BY: Jim Scholland DATE: 4/15/98

ITSI

ATTACHMENT B

COPIES OF LABORATORY REPORTS, CHROMATOGRAMS AND CHAIN-OF-CUSTODY FORM FOR GROUNDWATER SAMPLES

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

ANALYTICAL REPORT

Prepared for:

Innovative Technical Solutions, Inc.
2855 Mitchell Dr.
Suite 118
Walnut Creek, CA 94598

Date: 28-APR-98
Lab Job Number: 133175
Project ID: 95-113.49
Location: P/O 2277 7th St.

Reviewed by: Damara Moore

Reviewed by: Tracy Babian

TVH-Total Volatile Hydrocarbons

Client: Innovative Technical Solutions,Inc.
Project#: 95-113.49
Location: P/O 2277 7th St.

Analysis Method: EPA 8015M
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
133175-001	MW-5	40291	04/13/98	04/16/98	04/16/98	
133175-002	MW-7	40291	04/13/98	04/16/98	04/16/98	
133175-003	MW-4	40291	04/13/98	04/16/98	04/16/98	
133175-004	MW-2	40291	04/13/98	04/16/98	04/16/98	

Matrix: Water

Analyte	Units	133175-001	133175-002	133175-003	133175-004
Diln Fac:		1	1	1	1
Gasoline C7-C12	ug/L	<50	<50	150 YL	<50
Surrogate					
Bromofluorobenzene	%REC	115	111	114	114

Y: Sample exhibits fuel pattern which does not resemble standard
L: Lighter hydrocarbons than indicated standard

BTXE

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.49
Location: P/O 2277 7th St.

Analysis Method: EPA 8020A
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
133175-001	MW-5	40291	04/13/98	04/16/98	04/16/98	
133175-002	MW-7	40291	04/13/98	04/16/98	04/16/98	
133175-003	MW-4	40360	04/13/98	04/19/98	04/19/98	
133175-004	MW-2	40291	04/13/98	04/16/98	04/16/98	

Matrix: Water

Analyte Diln Fac:	Units	133175-001 1	133175-002 1	133175-003 5	133175-004 1
Benzene	ug/L	<0.5	<0.5	520	<0.5
Toluene	ug/L	<0.5	<0.5	2.9	<0.5
Ethylbenzene	ug/L	<0.5	<0.5	<2.5	<0.5
m,p-Xylenes	ug/L	<0.5	<0.5	<2.5	<0.5
o-Xylene	ug/L	<0.5	<0.5	<2.5	<0.5
Surrogate					
Trifluorotoluene	%REC	105	102	113	105
Bromofluorobenzene	%REC	100	97	106	101

TVH-Total Volatile Hydrocarbons

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.49
Location: P/O 2277 7th St.

Analysis Method: EPA 8015M
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
133175-005	QC-1	40291	04/13/98	04/15/98	04/15/98	
133175-006	TRIP BLANK	40291	04/13/98	04/15/98	04/15/98	

Matrix: Water

Analyte	Units	133175-005	133175-006
Diln Fac:		1	1
Gasoline C7-C12	ug/L	<50	<50
Surrogate			
Bromofluorobenzene	%REC	116	112

BTXE

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.49
Location: P/O 2277 7th St.

Analysis Method: EPA 8020A
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
133175-005	QC-1	40291	04/13/98	04/15/98	04/15/98	
133175-006	TRIP BLANK	40291	04/13/98	04/15/98	04/15/98	

Matrix: Water

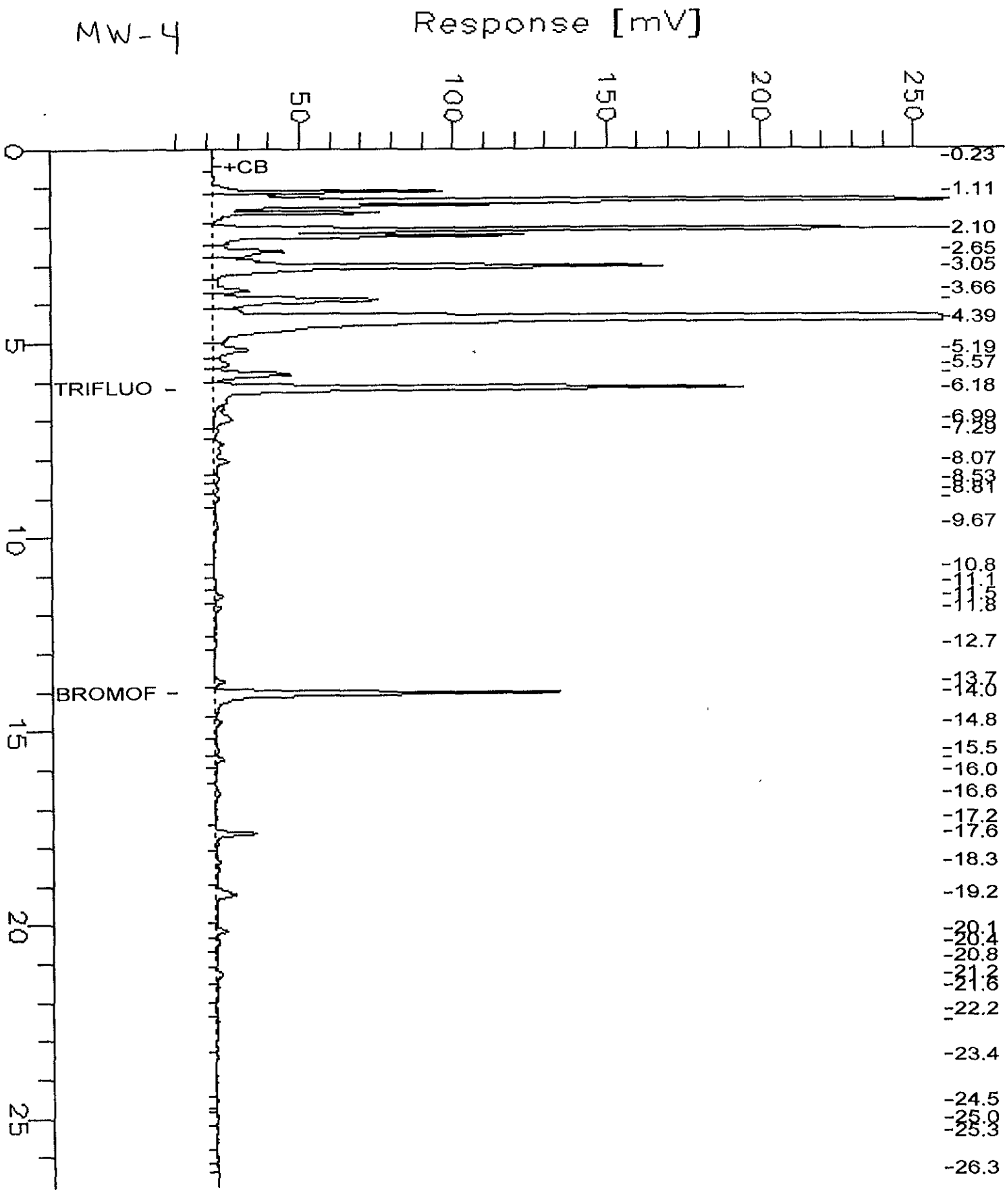
Analyte	Units	133175-005	133175-006
Diln Fac:		1	1
Benzene	ug/L	<0.5	<0.5
Toluene	ug/L	<0.5	<0.5
Ethylbenzene	ug/L	<0.5	<0.5
m,p-Xylenes	ug/L	<0.5	<0.5
o-Xylene	ug/L	<0.5	<0.5
Surrogate			
Trifluorotoluene	%REC	105	102
Bromofluorobenzene	%REC	99	97

GC05 'G' File TVH

Sample Name : S,133175-003,40291,
FileName : G:\GC05\DATA\105G014.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.80 min
Scale Factor: -1.0 Plot Offset: 9 mV

Sample #: Page 1 of 1
Date : 4/16/98 01:20 AM
Time of Injection: 4/16/98 12:52 AM
Low Point : 9.25 mV High Point : 259.25 mV
Plot Scale: 250.0 mV

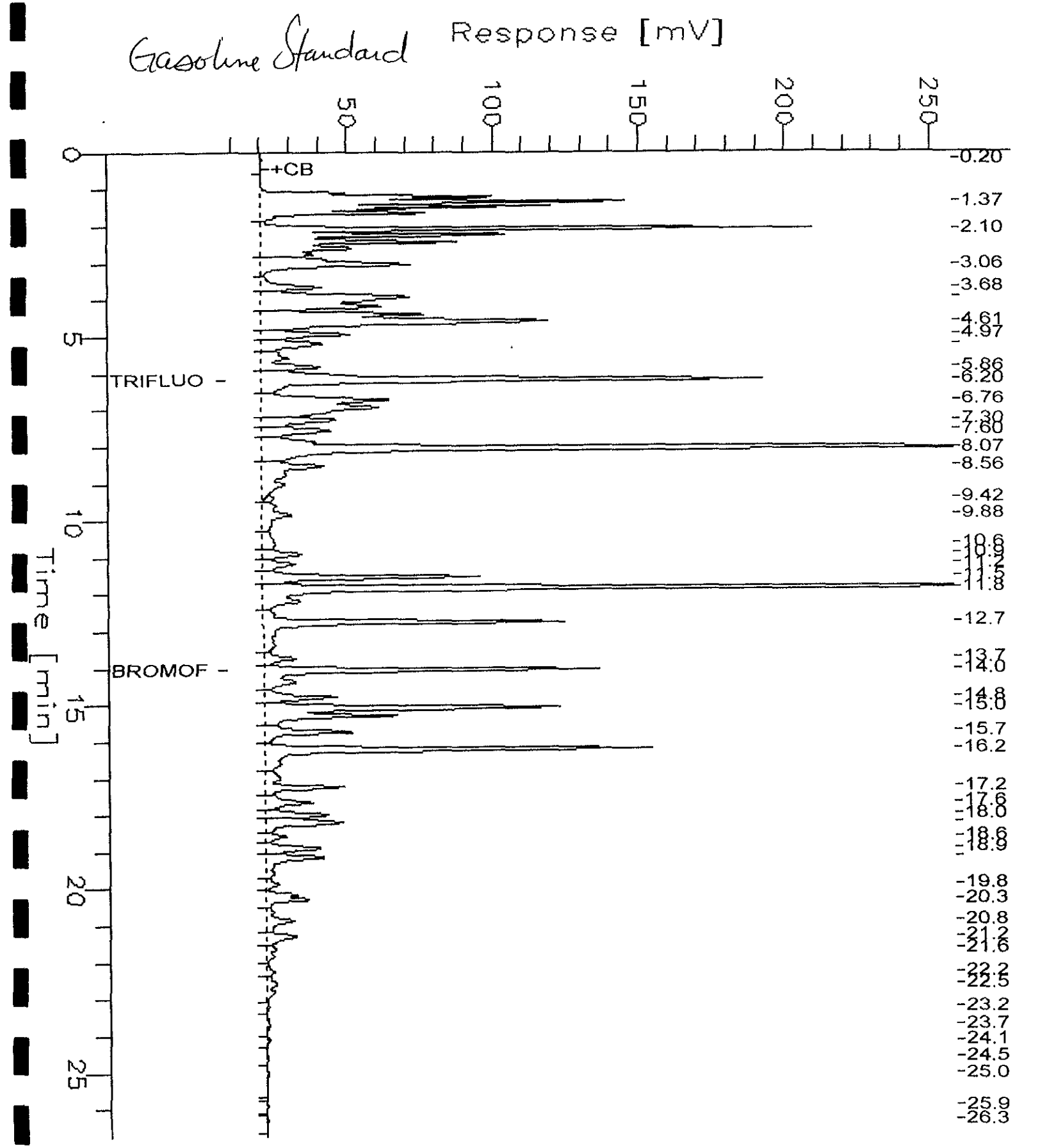
MW-4



GC05 'G' File TVH

Sample Name : CCV/LCS,QC68551,98WS5681,40291,
FileName : G:\GC05\DATA\105G002.raw
Method : TVHBTXE
Start Time : 0.00 min End Time : 26.80 min
Scale Factor: -1.0 Plot Offset: 8 mV

Sample #: GAS Page 1 of 1
Date : 4/15/98 06:04 PM
Time of Injection: 4/15/98 05:37 PM
Low Point : 7.98 mV High Point : 257.98 mV
Plot Scale: 250.0 mV



TVH-Total Volatile Hydrocarbons

Client:	Innovative Technical Solutions, Inc.	Analysis Method:	EPA 8015M
Project#:	95-113.49	Prep Method:	EPA 5030
Location:	P/O 2277 7th St.		

METHOD BLANK

Matrix:	Water	Prep Date:	04/15/98
Batch#:	40291	Analysis Date:	04/15/98
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC68553

Analyte	Result	
Gasoline C7-C12	<50	
Surrogate	**%Rec**	**Recovery Limits**
Bromofluorobenzene	99	59-162

Lab #: 133175

BATCH QC REPORT

Curtis & Tompkins Ltd.

BTXE

Client:	Innovative Technical Solutions,Inc.	Analysis Method:	EPA 8020A
Project#:	95-113.49	Prep Method:	EPA 5030
Location:	P/O 2277 7th St.		

METHOD BLANK

Matrix:	Water	Prep Date:	04/15/98
Batch#:	40291	Analysis Date:	04/15/98
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC68553

Analyte	Result
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
m,p-Xylenes	<0.5
o-Xylene	<0.5

Surrogate	%Rec	Recovery Limits
Trifluorotoluene	94	53-124
Bromofluorobenzene	85	41-142

Lab #: 133175 BATCH QC REPORT Curtis & Tompkins, Ltd.

BTXE

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.49
Location: P/O 2277 7th St.

Analysis Method: EPA 8020A
Prep Method: EPA 5030

METHOD BLANK

Matrix: Water
Batch#: 40360
Units: ug/L
Diln Fac: 1

Prep Date: 04/19/98
Analysis Date: 04/19/98

MB Lab ID: QC68809

Analyte	Result
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
m,p-Xylenes	<0.5
o-Xylene	<0.5

Surrogate	%Rec	Recovery Limits
Trifluorotoluene	101	53-124
Bromofluorobenzene	89	41-142

Lab #: 133175

BATCH QC REPORT

Curtis & Tompkins, Ltd.

TVH-Total Volatile Hydrocarbons

Client:	Innovative Technical Solutions,Inc.	Analysis Method:	EPA 8015M
Project#:	95-113.49	Prep Method:	EPA 5030
Location:	P/O 2277 7th St.		

LABORATORY CONTROL SAMPLE

Matrix:	Water	Prep Date:	04/15/98
Batch#:	40291	Analysis Date:	04/15/98
Units:	ug/L		
Diln Fac:	1		

LCS Lab ID: QC68551

Analyte	Result	Spike Added	%Rec #	Limits
Gasoline C7-C12	1852	2000	93	80-119

Surrogate	%Rec	Limits
Bromofluorobenzene	112	59-162

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 1 outside limits

BTXE	
Client: Innovative Technical Solutions,Inc.	Analysis Method: EPA 8020A
Project#: 95-113.49	Prep Method: EPA 5030
Location: P/O 2277 7th St.	

LABORATORY CONTROL SAMPLE	
Matrix: Water	Prep Date: 04/15/98
Batch#: 40291	Analysis Date: 04/15/98
Units: ug/L	
Diln Fac: 1	

LCS Lab ID: QC68552

Analyte	Result	Spike Added	%Rec #	Limits
Benzene	17.71	20	89	69-109
Toluene	18.35	20	92	72-116
Ethylbenzene	17.46	20	87	67-120
m,p-Xylenes	19.37	20	97	69-117
o-Xylene	18.14	20	91	75-122

Surrogate	%Rec	Limits
Trifluorotoluene	97	53-124
Bromofluorobenzene	93	41-142

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 5 outside limits

Lab #: 133175

BATCH QC REPORT

Curtis & Tompkins, Ltd.

TVH-Total Volatile Hydrocarbons

Client:	Innovative Technical Solutions, Inc.	Analysis Method:	EPA 8015M
Project#:	95-113.49	Prep Method:	EPA 5030
Location:	P/O 2277 7th St.		

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID:	ZZZZZZ	Sample Date:	04/07/98
Lab ID:	133081-001	Received Date:	04/07/98
Matrix:	Water	Prep Date:	04/16/98
Batch#:	40291	Analysis Date:	04/16/98
Units:	ug/L		
Diln Fac:	1		

MS Lab ID: QC68554

Analyte	Spike Added	Sample	MS	%Rec #	Limits
Gasoline C7-C12	2000	<50	1947	97	71-131

Surrogate	%Rec	Limits
Bromofluorobenzene	124	59-162

MSD Lab ID: QC68555

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
Gasoline C7-C12	2000	1880	94	71-131	3	26

Surrogate	%Rec	Limits
Bromofluorobenzene	124	59-162

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 1 outside limits
Spike Recovery: 0 out of 2 outside limits

Lab #: 133175

BATCH QC REPORT

Curtis & Tompkins, Ltd.

BTXE

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.49
Location: P/O 2277 7th St.

Analysis Method: EPA 8020A
Prep Method: EPA 5030

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 40360
Units: ug/L
Diln Fac: 1

Prep Date: 04/19/98
Analysis Date: 04/19/98

BS Lab ID: QC68812

Analyte	Spike Added	BS	%Rec #	Limits
Benzene	20	20.16	101	69-109
Toluene	20	20.69	103	72-116
Ethylbenzene	20	20.2	101	67-120
m,p-Xylenes	20	20.69	103	69-117
o-Xylene	20	20.12	101	75-122

Surrogate	%Rec	Limits
Trifluorotoluene	110	53-124
Bromofluorobenzene	106	41-142

BSD Lab ID: QC68813

Analyte	Spike Added	BSD	%Rec #	Limits	RPD #	Limit
Benzene	20	21.09	105	69-109	5	11
Toluene	20	20.93	105	72-116	1	11
Ethylbenzene	20	20.9	105	67-120	3	12
m,p-Xylenes	20	21.44	107	69-117	4	11
o-Xylene	20	20.95	105	75-122	4	12

Surrogate	%Rec	Limits
Trifluorotoluene	110	53-124
Bromofluorobenzene	109	41-142

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

TEH-Tot Ext Hydrocarbons

Client: Innovative Technical Solutions,Inc.
Project#: 95-113.49
Location: P/O 2277 7th St.

Analysis Method: EPA 8015M
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
133175-001	MW-5	40328	04/13/98	04/16/98	04/26/98	
133175-002	MW-7	40328	04/13/98	04/16/98	04/26/98	
133175-003	MW-4	40328	04/13/98	04/16/98	04/26/98	
133175-004	MW-2	40328	04/13/98	04/16/98	04/26/98	

Matrix: Water

Analyte	Units	133175-001	133175-002	133175-003	133175-004
Diln Fac:		1	1	1	1
Diesel C12-C22	ug/L	<47	<48	<50	<50
Motor Oil C22-C50	ug/L	<280	<290	<300	<300
Surrogate					
Hexacosane	%REC	78	74	80	74

TEH-Tot Ext Hydrocarbons

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.49
Location: P/O 2277 7th St.

Analysis Method: EPA 8015M
Prep Method: EPA 3520

METHOD BLANK

Matrix: Water
Batch#: 40328
Units: ug/L
Diln Fac: 1

Prep Date: 04/16/98
Analysis Date: 04/25/98

MB Lab ID: QC68701

Analyte	Result
Diesel C12-C22	<50
Motor Oil C22-C50	<300

Surrogate	%Rec	Recovery Limits
Hexacosane	63	53-136

TEH-Tot Ext Hydrocarbons

Client: Innovative Technical Solutions,Inc.
Project#: 95-113.49
Location: P/O 2277 7th St.

Analysis Method: EPA 8015M
Prep Method: EPA 3520

LABORATORY CONTROL SAMPLE

Matrix: Water
Batch#: 40328
Units: ug/L
Diln Fac: 1

Prep Date: 04/16/98
Analysis Date: 04/25/98

LCS Lab ID: QC68702

Analyte	Result	Spike Added	%Rec #	Limits
Diesel C12-C22.	1580	2475	64	58-110
Surrogate	**%Rec**	**Limits**		
Hexacosane	65	53-136		

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 1 outside limits

TEH-Tot Ext Hydrocarbons

Client: Innovative Technical Solutions, Inc.
Project#: 95-113.49
Location: P/O 2277 7th St.

Analysis Method: EPA 8015M
Prep Method: EPA 3520

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID: ZZZZZZ
Lab ID: 133177-001
Matrix: Water
Batch#: 40328
Units: ug/L
Diln Fac: 1

Sample Date: 04/14/98
Received Date: 04/14/98
Prep Date: 04/16/98
Analysis Date: 04/25/98

MS Lab ID: QC68703

Analyte	Spike Added	Sample	MS	%Rec #	Limits
Diesel C12-C22	2357	<50	1566	63	58-110
Surrogate	%Rec	Limits			
Hexacosane	66	53-136			

MSD Lab ID: QC68704

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
Diesel C12-C22	2380	1825	74	58-110	21	21
Surrogate	%Rec	Limits				
Hexacosane	80	53-136				

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 1 outside limits
Spike Recovery: 0 out of 2 outside limits

INNOVATIVE TECHNICAL SOLUTIONS, Inc.

1330 Broadway, Suite 1625
Oakland, California 94612
(510) 286-8888 (Tel), (510) 286-8889 (Fax)

133175

4/13/98

DATE ~~4/9/98~~

PAGE 1 of 1

PROJECT NAME: P/O 2277 7th St.
PROJECT NUMBER: 95-113.49
SITE LOCATION: Oakland, CA

CHAIN OF CUSTODY

	SAMPLE ID	SAMPLE DEPTH	DATE	TIME	NUMBER OF CONTAINERS	TYPE OF CONTAINERS	SAMPLE MATRIX	ANALYSIS: TPH as Gas/BTEX - 8015/8020	TPH as Diesel - 8015 TPH signals d.y.	TPH as Diesel - 8015 (w/ Silica Gel Cleanup)	TEPH - 8015	TEPH-8015 (w/ Silica Gel Cleanup)	TRPH - 418.1	Oil and Grease - 5520	Purgeable Halocarbons -601/8010	VOCs -624/ 8240	SVOCs -625/8270	LUFT Metals (Cd, Cr, Ni, Pb, Zn)	CAM 17 Metals	SPECIAL INSTRUCTIONS/COMMENTS
1:	~~MW-5~~	—	~~4/9/98~~	1100	2	VOAs	H_2O	X												Curtis & Tomplin Lab Berkeley, CA (WO # 028691)
	~~MW-7~~ MW-5	—	4/13	~~1504~~ 1500	1	1Lamber	↓		X											
2:	MW-7	—	4/13	1504	2	VOA		X												one has bubbles
	~~MW-4~~ MW-7	—	↓	↓	1	1Lamb.			X											
3:	MW-4	—	4/13	1635	2	VOA	H_2O	X												
	↓		↓	↓	1	1Lamb.			X											
4:	MW-2	—	4/13	1740	2	VOA		X												
	↓		↓	↓	1	1Lamb.			X											
5:	QC-1	—	4/13	—	2	VOA		X												
6:	Trip Blank	—	—	~~Lab~~ Traveled	2	VOA	↓	X												
																				Not used
	TOTAL NUMBER OF CONTAINERS				16	TOTAL TESTS		6	4											

SAMPLED BY: Ashley C. Foster
SIGNATURE: Ashley C. Foster

SPECIAL INSTRUCTIONS/COMMENTS: Standard TAT, Please Provide Chromats.

RELINQUISHED BY: Ashley Foster / Ashley Foster — Printed Name / Signature
ITSI — 4/13/98 7:30 PM — Company / Date and Time

RECEIVED BY: Tracy / Tracy Bob — Printed Name / Signature
C&T — 4/13/98 7:30 PM — Company / Date and Time

RELINQUISHED BY: _____ — Printed Name / Signature
_____ — Company / Date and Time

RECEIVED BY _____ — Printed Name / Signature
_____ — Company / Date and Time

RELINQUISHED BY: _____ — Printed Name / Signature
_____ — Company / Date and Time

RECEIVED BY: _____ — Printed Name / Signature
_____ — Company / Date and Time

SEND RESULTS TO: Ashley Foster, ITSI, 2855 Mitchell Drive, Suite 118, Walnut Creek, CA 94598 — FAX + Mail include chromatograms