RO-324

GET
Geo Environmental Technologies

3275 Stevens Creek Blvd. #208
San Jose, CA 95117
408-241-1798
FAX 408-248-7685

JUN 1 1 2002

GROUNDWATER MONITORING REPORT
Second Quarter 2002

For
Livermore Gas and Mini Mart
160 Holmes Street
Livermore, California

Prepared for:

Manwel and Samira Shuwayhat

5/30/02

Costas Orountiotis
Project Manager
Date

REGISTERED PROFESSIONAL ENGINEER
KENNETH L. MELEEN
CO17487
EXP 06/30/05
CIVIL
STATE OF CALIFORNIA

5/28/02

Kenneth L. Meleen
Senior Engineer
Date

May 28, 2002

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 PAST WORK ON SITE 1

3.0 SITE CONTACTS 3

4.0 METHODS AND PROCEDURES 3
- 4.1 Sample Collection and Analysis 3
- 4.2 Results 4
- 4.3 Groundwater Flow and Gradient 4

5.0 RECOMMENDATIONS 5

TABLES

Table 1: Well Construction Details
Table 2: Groundwater Analytical Results

FIGURES

Figure 1: Site Vicinity Map
Figure 2: Site Map
Figure 3: Groundwater Analyticals
Figure 4: Groundwater Flow and Gradient

APPENDICES

Appendix A: Field Data Sheet
Appendix B: Laboratory Report of Groundwater Analysis
Chain of Custody Report

GROUNDWATER MONITORING REPORT
SECOND QUARTER 2002

Livermore Gas and Mini Mart
160 Holmes Street
Livermore, California

1.0 INTRODUCTION

This report documents the results of the May 7, 2002 quarterly groundwater monitoring performed at the Livermore Gas and Mini Mart, located at 160 Holmes Street in Livermore, California (site). A site vicinity map is presented as Figure 1. Current site details are shown on the Site Plan, Figure 2.

The Livermore Gas and Mini Mart had been serviced by three 10,000-gallon gasoline and one 10,000-gallon diesel Underground Storage Tanks (USTs). The USTs and associated piping and dispensers were removed on 4/5/99 under permit from the Livermore-Pleasanton Fire Department (LPFD). Based on the analysis of soil and groundwater samples collected at the time of the UST removal, soil and groundwater beneath the site have been impacted by release of petroleum hydrocarbons and MTBE.

Work was performed in compliance with the Alameda County Environmental Health Services (ACEHS) guidelines and directives.

2.0 PAST WORK ON SITE

On 2/26/99, a soil boring was advanced in the northern section of the property, about 10 feet from the edge of First Street sidewalk, to log the soil profile and determine depth to groundwater. A groundwater grab sample was collected and analyzed for Total Petroleum Hydrocarbons as gasoline (TPHg), benzene, toluene, ethyl-benzene, total xylenes (BTEX) and methyl tertiary butyl ether (MTBE). The sample was found to be impacted by petroleum hydrocarbons (TPHg: 100,000 ug/l, Benzene: 6,100 ug/l, MTBE: 60,000 ug/L). The results were communicated to the Livermore-Pleasanton Fire Department (LPFD) and a UST Unauthorized Release Report was generated.

On 4/5/99, three gasoline and one diesel USTs, associated dispensers and piping were removed, manifested and disposed, under permit by the LPFD. The pit was over-excavated and samples were collected from native soil beneath the USTs; sample analysis indicated the presence of petroleum hydrocarbons in soil. Total Petroleum Hydrocarbons as diesel (TPHd) were detected at low levels (61 mg/kg) in the soil stockpile, but not beneath the diesel tank; Total Petroleum Hydrocarbons as gasoline (TPHg) concentrations ranged from undetectable to 80 mg/kg in all samples; MTBE concentrations ranged from 24 to 110 mg/kg.

On 5/20/99 soil samples were collected beneath the dispenser islands. TPHg was found beneath the east dispenser island in varying concentrations ranging from 32 mg/kg to 6,500 mg/kg; TPHd beneath the diesel dispenser was detected at 1300 mg/kg; no MTBE was detected beneath the dispenser islands.

On 7/26/00, three soil borings were drilled onsite to an approximate depth of 30-feet below ground surface (bgs). Soil samples were collected for analyses. Upon completion of drilling activities, the soil borings were converted to groundwater monitoring wells (MW1, MW2 and MW3) by installing 2-inch diameter, Schedule 40, factory threaded polyvinyl chloride (PVC) slotted 0.010-inch. The slotted interval extends from 15 to 30 feet bgs. The wells were sampled on 8/11/00 and analyzed for TPHd, TPHg, BTEX and MTBE. The sample results indicated significant hydrocarbon impact in the groundwater. Directly downgradient well MW1 had concentrations of TPHg and MTBE of 170,000 ug/L and 320,000 ug/L respectively. A "Well Installation Report" was issued by ETIC Engineering on 9/22/00.

On 10/19/00 groundwater samples were collected as part of quarterly monitoring at the site. Samples were analyzed for TPHd, TPHg, BTEX and MTBE. The sample results confirmed the presence of significant hydrocarbon impact in the groundwater. Directly downgradient well MW1 had concentrations of TPHg and MTBE of 170,000 ug/L and 200,000 ug/L respectively. Geo Environmental Technologies issued a "Quarterly Monitoring Report" on January 31, 2000.

On 02/22/01 groundwater samples were collected as part of quarterly monitoring at the site. Samples were analyzed for TPHd, TPHg, BTEX and MTBE. The sample results confirmed the presence of significant hydrocarbon impact in the groundwater. Directly downgradient well MW1 had concentrations of TPHg and MTBE of 11,000 ug/L and 190,000 ug/L respectively. Geo Environmental Technologies issued a "Quarterly Monitoring Report" on March 31, 2001.

On 05/30/01 groundwater samples were not collected because all three monitoring wells were found to be dry. The monitoring wells were dry also in August and November 2001.

On 11/14/01 groundwater samples were collected during the installation of an onsite extraction well and three offsite monitoring wells. Monitoring wells MW1, MW2 and MW3 were all dry. Groundwater samples were collected from the four newly installed wells as part of quarterly monitoring at the site. Samples were analyzed for TPHd, TPHg, BTEX and MTBE. The sample results confirmed the presence of significant hydrocarbon concentrations offsite and an areal impact to the groundwater. Directly downgradient extraction well EX1 contained concentrations of TPHg and MTBE of 2,000 ug/L and 2,200 ug/L respectively. Geo Environmental Technologies issued a "Quarterly Monitoring Report" on March 31, 2001. Construction details of all wells are presented in Table 1.

3.0 SITE CONTACTS

The following is a listing of site contacts, addresses and phone numbers.

UST Operator:	Livermore Gas and Mini Mart Attention: Manwel and Samira Shuwayhat 160 Holmes Street Livermore, CA 94520 Phone: (925) 455-4212
Local Oversight Agency:	ACEHS Attention: Eva Chu 1131 Harbor Bay Parkway, Suite 250 Alameda, CA 94502 Phone: (510) 567-6700
Environmental consultant:	Geo Environmental Technologies Attention: Costas Orountiotis 3275 Stevens Creek Boulevard, Suite 208 San Jose, CA 95117 Phone: (408) 241-1798

4.0 METHODS AND PROCEDURES

4.1 Sample Collection and Analysis

Groundwater samples were collected from the site monitoring wells on 5/07/02. Depth to groundwater (DTW) was measured in each of the monitoring wells prior to purging and sampling. DTW data is summarized in Table 2. A sample of static groundwater was collected from each well using a clean, clear plastic bailer to visually assess for the presence of floating product or product sheen. No floating product or sheen was found.

Groundwater samples were collected by carefully decanting groundwater from the bailer into the requisite sample containers. Groundwater samples for TPHg, BTEX and MTBE analyses were collected in 40-ml VOA vials with caps equipped with Teflon lined septa, in such a manner that neither headspace nor air bubbles were allowed to remain in the containers. Samples for TPHd analysis were collected in 1-liter amber glass bottles.

Groundwater samples were collected, labeled and placed in a pre-cooled container on ice, to minimize potential loss of volatile constituents. Labels contained project name, sample number, date and time of collection and the identity of the sampler. Samples were collected using new, clean, disposable plastic bailers.

Field data notes are presented in Appendix A.

Sample collection information was entered onto a Chain of Custody (COC) document that accompanied the samples during site time and during transport to Severn Trent laboratories of San Francisco (formerly Chromalab Inc.), a State certified laboratory for hazardous materials analyses, for the requisite analyses.

Groundwater samples were analyzed for TPHg, BTEX and MTBE using EPA Methods SW846/8020A Nov 1990/8015 Mod and for TPHd using EPA Method 8015M.

4.2 Results

Monitoring wells MW1 and MW3 were dry for the third quarterly monitoring event in a row. Very strong hydrocarbon odor was noted in well MW1; no discernible odor was noted in well MW2.

TPHd was detected in monitoring well MW2 and extraction well EX1 at 86 and 560 ug/L, respectively.

TPHg was found in all monitoring/extraction wells sampled, with the exception of farthest downgradient well MW6. Extraction well EX1 contained the highest TPHg concentrations, 7,700 ug/L and offsite wells MW4 and MW5 contained 150 and 140 ug/l respectively; onsite well MW2 contained 400 ug/l TPHg.

MTBE was found in extraction well EX1 at 6,200 ug/L. Offsite wells MW4 and MW5 contained 48 and 110 ug/l of MTBE respectively; onsite well MW2 contained 230 ug/l of MTBE.

Cumulative groundwater analytical results are presented in Table 2. Copies of the Chain of Custody document and laboratory analysis report for this monitoring event are presented in Appendix B.

4.3 Groundwater Flow and Gradient

Depth to groundwater measurements that were taken on May 7, 2002 have been used to calculate the groundwater gradient and flow direction. Groundwater flow direction is northeasterly, consistent with general area direction of flow. The gradient was 0.0154 ft/ft. This information is presented graphically in Figure 4.

5.0 RECOMMENDATIONS

Based on the results of this groundwater monitoring episode, the following course of action is recommended:

- It appears that silt has accumulated in monitoring wells MW1 and MW3. In order to facilitate future on-site groundwater monitoring, MW1 and MW3 must be redeveloped.
- Continue quarterly groundwater sampling and depth to water data collection. Next monitoring date within a 15-day window of opportunity, is August 07, 2002.
- Proceed with the previously recommended pump test and MTBE feasibility test.
- A copy of this report should be forwarded to: ACEHS
  Attention: Eva Chu
  1131 Harbor Bay Parkway, Suite 250
  Alameda, CA 94502

TABLES

TABLE 1 - Well Consrtruction Details

Livermore Gas and Minimart, 160 Holmes, Livermore, California

Well Number	Date Installed	Total Depth (feet bgs)	Borehole Diameter (inches)	Casing Diameter (inches)	Slot (inch)	Interval					DTW 5/7/02 (feet)
						Screen (feet)	Blank Casing (feet)	Sand Pack (feet)	Bentonite Seal (feet)	Cement Grout (feet)	
MW-1	07/26/00	30	8	2	0.01	30-15	15-0.5	30-13	13-11	11-1.0	dry
MW-2	07/26/00	30	8	2	0.01	30-15	15-0.5	30-13	13-11	11-1.0	26.70
MW-3	07/26/00	30	8	2	0.01	30-15	15-0.5	30-13	13-11	11-1.0	dry
MW-4	10/30/01	50	8	2	0.01	50-20	20-0.5	50-18	18-16	16-0.5	26.75
MW-5	10/30/01	50	8	2	0.01	50-20	20-0.5	50-18	18-16	16-0.5	27.90
MW-5	10/30/01	50	8	2	0.01	50-20	20-0.5	50-18	18-16	16-0.5	27.01
EX1	10/30/01	55	10	6	0.01	55-30	30-0.5	55-28	28-26	26-0.5	27.58

Notes: bgs Below ground surface
DTW Depth to water

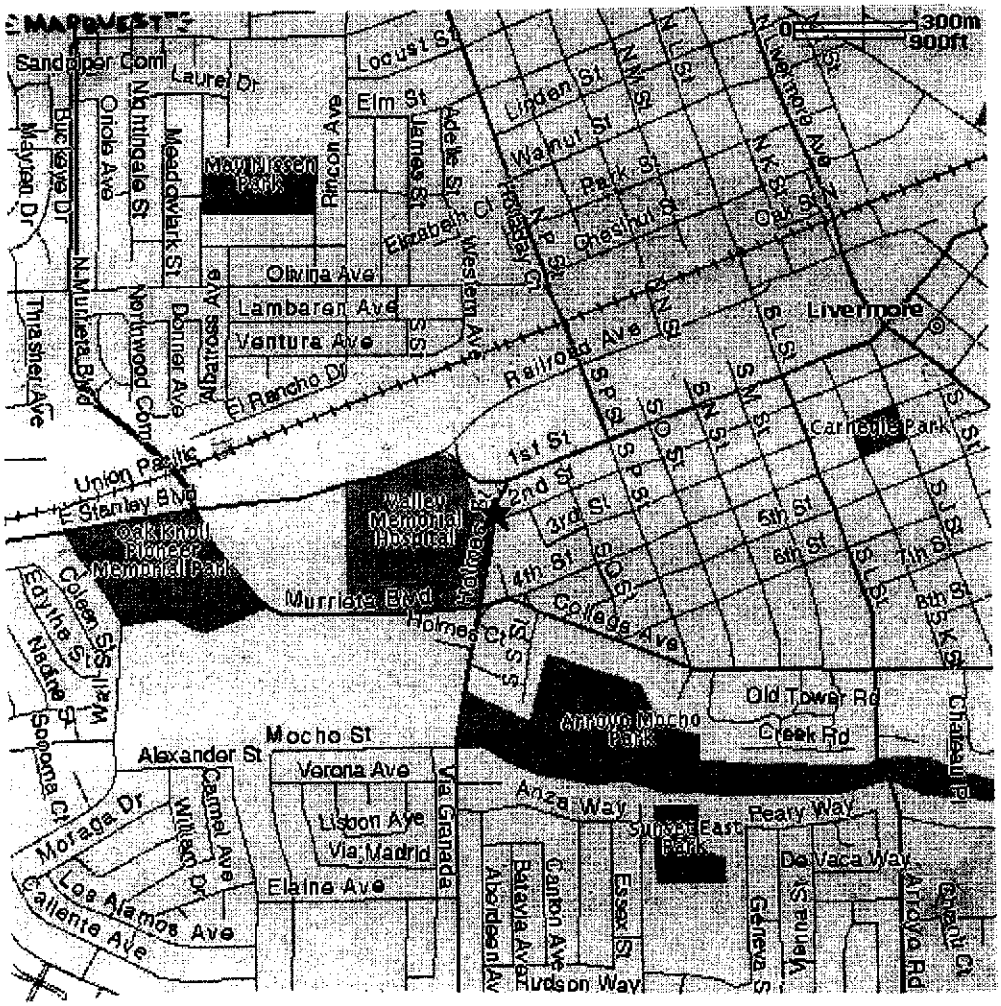
TABLE 2 - Groundwater Analytical Results

Livermore Gas and Minimart, 160 Holmes, Livermore, California

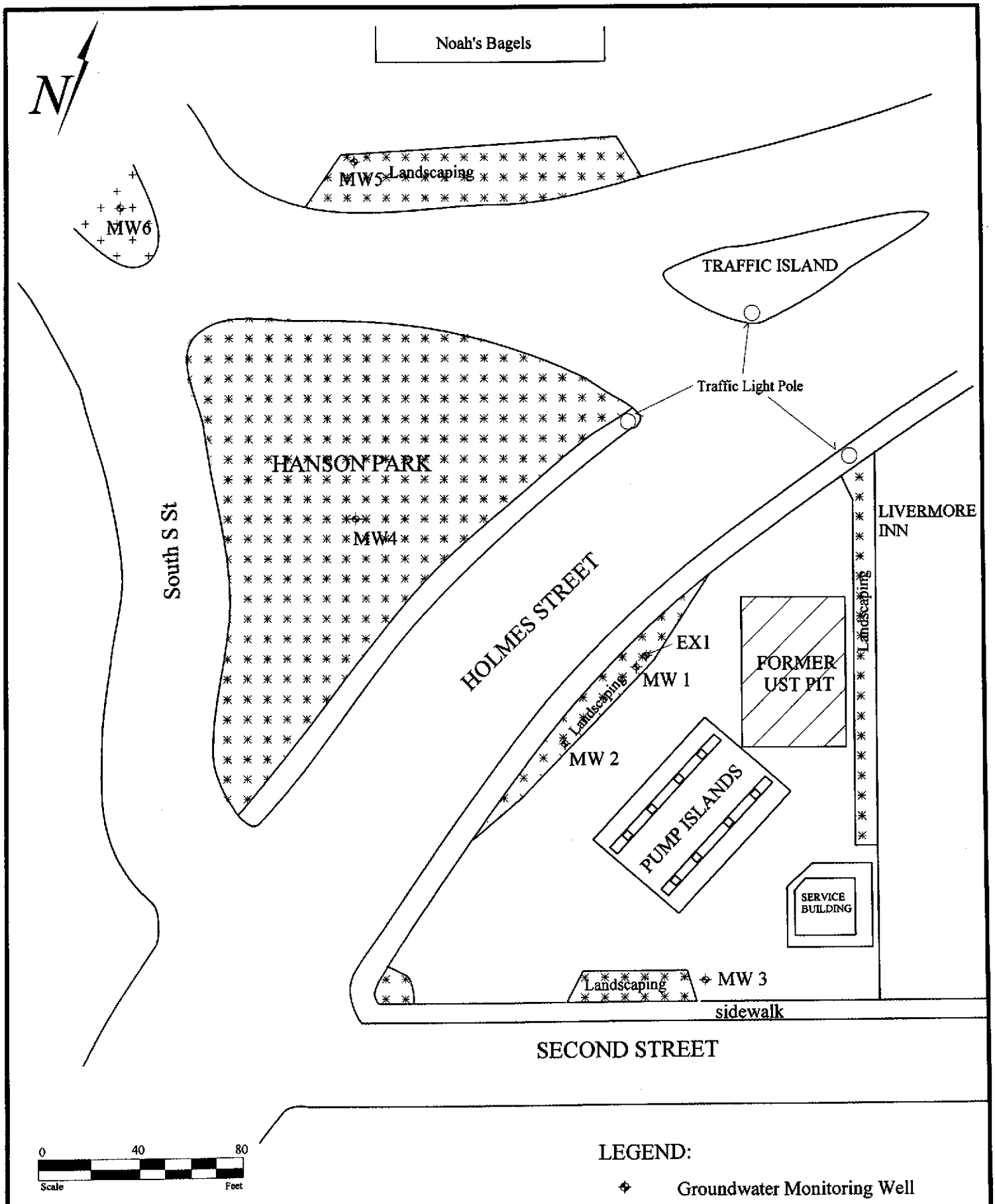
Well ID.	Date	DTW (feet)	TPHd (µg/L)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-Benzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)
MW1	08/11/00		57,000	170,000	6,400	7,600	4,200	9,700	320,000
	10/19/00	21.94	17,000	170,000	8,400	3,200	2,700	10,000	200,000
	02/22/01	22.91	11,000	82,000	5,100	1,000	13,000	8,700	190,000
	05/30/01	Dry							
	11/14/01	Dry							
	05/07/02	Dry							
MW2	08/11/00		1,900	4,500	220	52	160	170	3,000
	10/19/00	21.80	1,300	3,400	150	21	100	70	1,900
	02/22/01	22.87	880	7,600	25	< 10	69	25	2,200
	05/30/01	Dry							
	11/14/01	Dry							
	05/07/02	26.70	86	400	5	<0.50	2	2	230
MW3	08/11/00		260	59	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0
	10/19/00	22.45	< 65	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0
	02/22/01	23.51	100	< 50	< 0.50	< 0.50	< 0.50	< 0.50	< 5.0
	05/30/01	Dry							
	11/14/01	Dry							
	05/07/02	Dry							
MW-4	11/14/01	33.84	90	510	4	<0.50	<0.50	<0.50	14
	05/07/02	26.75	<50	150	3.5	,0.50	<0.50	<0.50	48
MW-5	11/14/01	34.94	<66	<50	<0.50	<0.50	<0.50	<0.50	8.2
	05/07/02	27.90	<50	140	<0.50	<0.50	<0.50	<0.50	110.0
MW-6	11/14/01	33.88	<50	<50	<0.50	<0.50	<0.50	<0.50	<5.0
	05/07/02	27.01	<67	<50	<0.50	<0.50	<0.50	<0.50	<5.0
EX1	11/14/01	33.41	2,000	13,000	180	1,000	330	3,200	2,200
	05/07/02	27.58	560	7,700	320	<25	66	150	6,200

Notes:
DTW: Depth to Groundwater Elevation
TPHg: Total Petroleum Hydrocarbons as gasoline
TPHd: Total Petroleum Hydrocarbons as diesel
MTBE: Methyl tertiary butyl ether
µg/L: Micrograms per liter

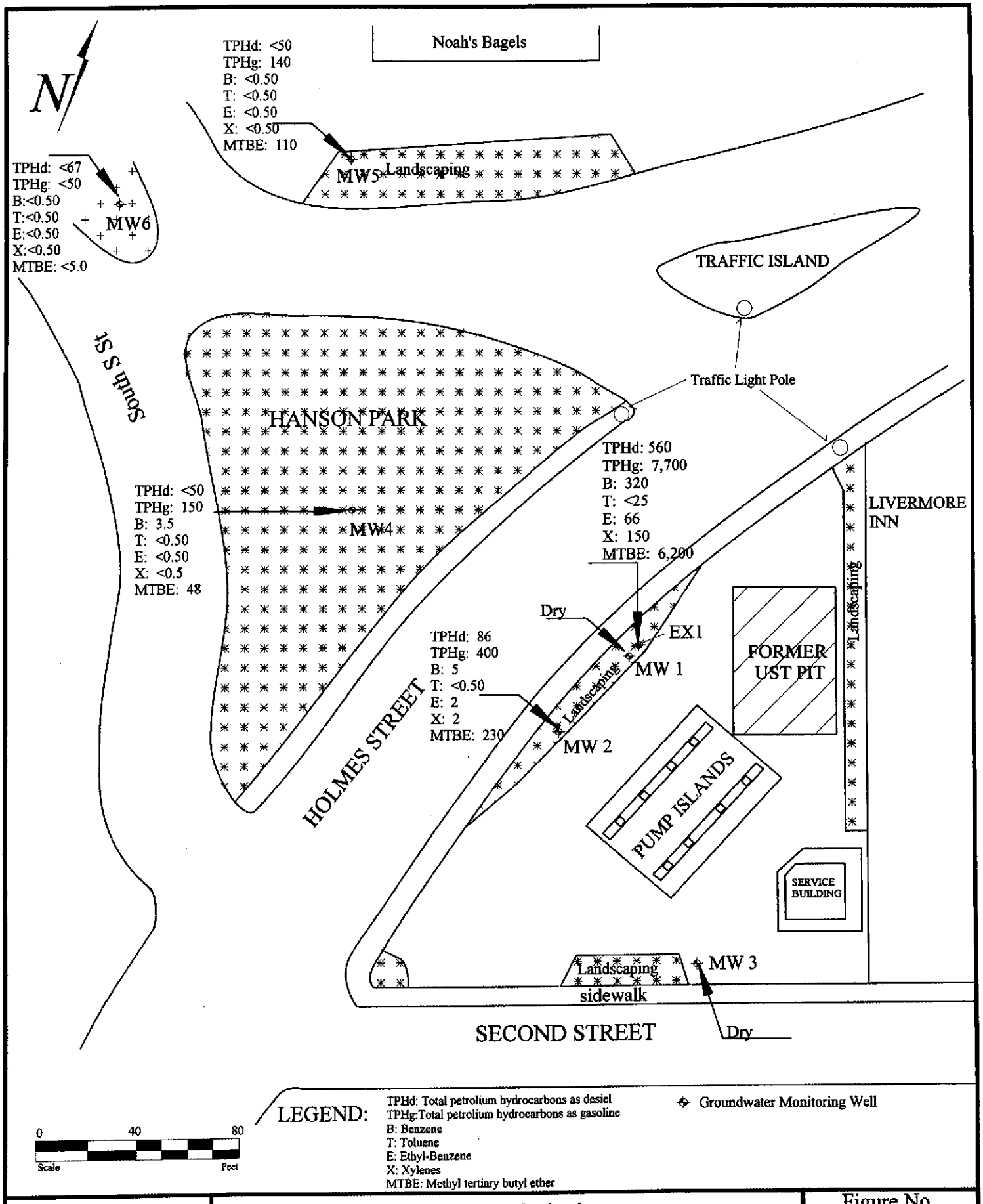
FIGURES



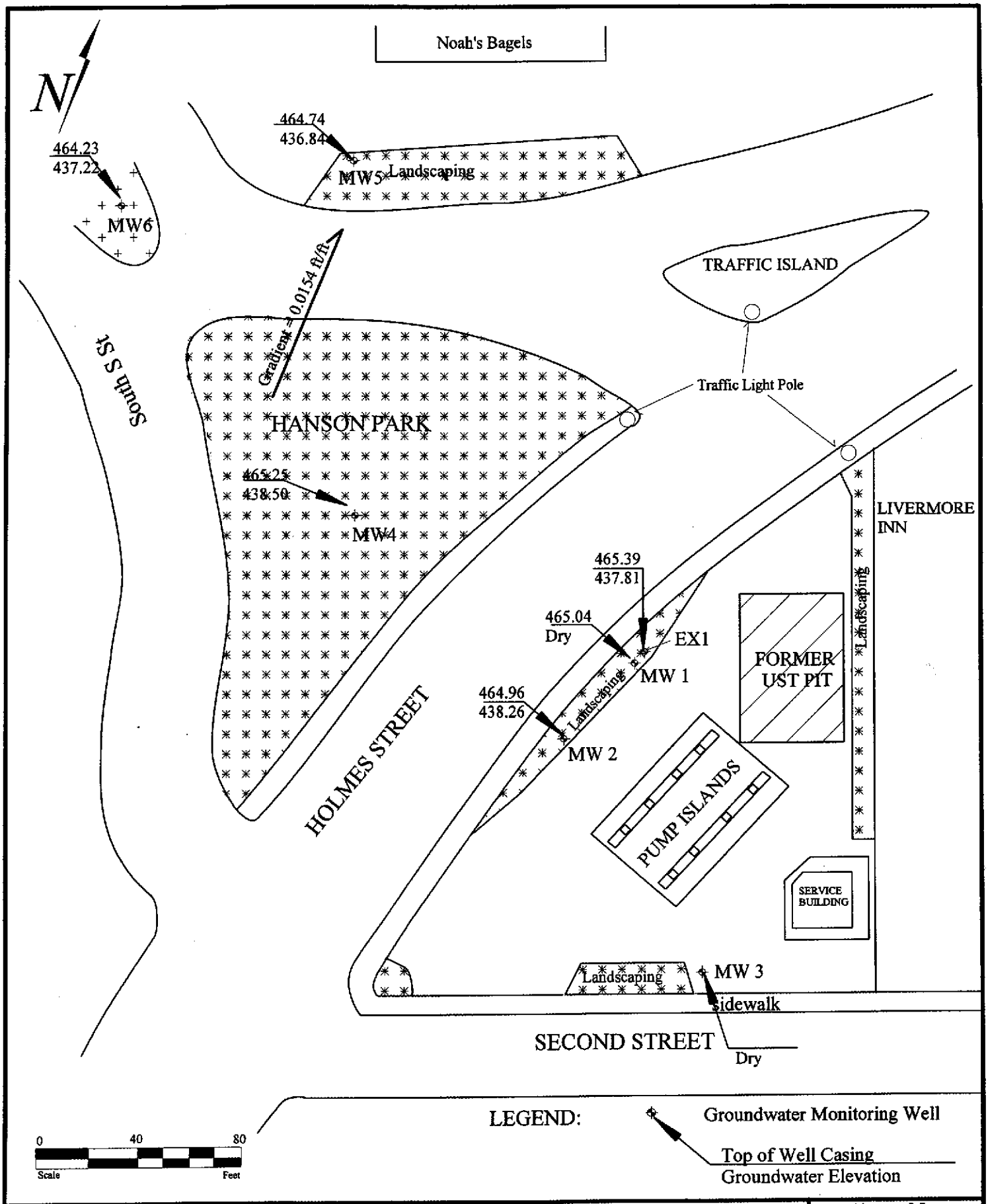
Geo Environmental Technologies	SITE VICINITY MAP Livermore Gas and Minimart 160 Homes Street, Livermore, CA	Figure No. 1 Project Manwel



Geo Environmental Technologies	SITE PLAN Livermore Gas and Minimart 160 Homes Street, Livermore, CA	Figure No. 2 Project Manwel



Geo Environmental Technologies	Groundwater Analyticals 05/07/02 Livermore Gas and Minimart 160 Homes Street, Livermore, CA	Figure No. 3 Project Manwel



Geo Environmental Technologies	Groundwater Direction and Gradient 05/07/02 Livermore Gas and Minimart 160 Homes Street, Livermore, CA	Figure No. 4 Project Manwel

Appendix A

Field Data

Field data sheet

MANWELL
160 Homes Street, Livermore, CA

4/29.96

Well	Sampling date	DTW	pH	Conductivity us/cm	Temp C	Comments
MW1	05/07/02	26.35 dry				
MW2	05/07/02	26.7				
MW3	05/07/02	26.78	dry	dry	dry	dry
MW4	05/07/02	26.75				
MW5	05/07/02	27.90				
MW6	05/07/02	27.01				
EX1	05/07/02	27.58		Strong odor!		

Notes: DTW: Depth to Water
us/cm: microsiemens/centimeter
C: degrees celsius

Appendix B

Chain of Custody
&
Laboratory Report of Groundwater Analysis

CHROMALAB, INC.

Environmental Services (SDB) (DOHS 1094)

1220 Quarry Lane • Pleasanton, California 94566-4756
(925) 484-1919 • Fax (925) 484-1096

2002-05-0136

Reference #: 66253

Chain of Custody

DATE 5/7/02 PAGE 1 OF 1

PROJ. MGR Costas Orountiotis
COMPANY GET
ADDRESS 3275 Stevens Creek Blvd #205
San Jose Ca

SAMPLERS (SIGNATURE) Renee Cadsi
(PHONE NO.) 408 248-7683
(FAX NO.) 408 248 7695

ANALYSIS REPORT

SAMPLE ID.	DATE	TIME	MATRIX	PRESERV.	TPH-(EPA 8015,8020) ☒ Gas w/ ☒ BTEX ☒ MTBE	PURGEABLE AROMATICS BTEX (EPA 8020)	TPH-Diesel (EPA 8015M)	TEPH (EPA 8015M) ☐ Diesel ☐ M.O. ☐ Other	PURGEABLE HALOCARBONS (HVOCs) (EPA 8010)	VOLATILE ORGANICS (VOCs) (EPA 8260)	SEMIVOLATILES (EPA 8270)	Oil & Grease ☐ Petrol ☐ Total ☐ 1664		☐ PESTICIDES (EPA 8080) ☐ PCB'S (EPA 8080)	PNA's by ☐ 8270 ☐ 8310	☐ Spec. Cond. ☐ TSS ☐ TDS	LUFT METALS: Cd, Cr, Pb, Ni, Zn	CAM 17 METALS (EPA 6010/7470/7471)	TOTAL LEAD	☐ W.E.T. (STLC) ☐ TCLP	☐ Hexavalent Chromium ☐ pH (24 hr hold time for H20)				NUMBER OF CONTAINERS
~~MW1~~																									
MW2	5/7/02		H_2O		X	X		X																	3
~~MW3~~																									
MW4	5/7/02		H_2O		X	X		X																	3
MW5	5/7/02		H_2O		X	X		X																	3
MW6	5/7/02		H_2O		X	X		X																	3
EX1	5/7/02		H_2O		X	X		X																	3

PROJECT INFORMATION

PROJECT NAME: Manwel
PROJECT NUMBER: Manwel
P.O. #:

TAT: STANDARD 5-DAY | 24 | 48 | 72 | OTHER

SPECIAL INSTRUCTIONS/COMMENTS:
Report: ☐ Routine ☐ Level 2 ☐ Level 3 ☐ Level 4 ☐ Electronic Report

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS: 15
HEAD SPACE:
TEMPERATURE: 4.0°C
CONFORMS TO RECORD:

	1.	2.	3.
RELINQUISHED BY	Renee Cadsi		1713
(SIGNATURE) (TIME)			D. Morrow 5-8-02
(PRINTED NAME) (DATE)	RENEE Cadsi		STL-SF
(COMPANY)	GET		
RECEIVED BY			D. Harrington
(SIGNATURE) (TIME)			D Harrington 1713
(PRINTED NAME) (DATE)	D. Morrow 5/8/02		STL-SF 5/8/02
(COMPANY)	STL-SF		

Submission #: 2002-05-0136

REVISED

Diesel

SEVERN TRENT SERVICES

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Geo Enviromental Technologies	✉ 3275 Stevens Creek Blvd #208 San Jose, CA 95117
Attn: Costas Orountiotis	Phone: (408) 241-1798 Fax: (408) 248-7685
Manwel	Project: Manwel

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MW2	Water	05/07/2002	1
MW4	Water	05/07/2002	2
MW5	Water	05/07/2002	3
MW6	Water	05/07/2002	4
EX1	Water	05/07/2002	5

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

Diesel

Geo Enviromental Technologies
Attn: Costas Orountiotis

Test Method: 8015M
Prep Method: 3510/8015M

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID:	**MW2**	Lab Sample ID:	2002-05-0136-001
Project:	Manwel Manwel	Received:	05/08/2002 17:13
		Extracted:	05/09/2002 09:42
Sampled:	05/07/2002	QC-Batch:	2002/05/09-01.10
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	86	50	ug/L	1.00	05/09/2002 17:17	ndp
Surrogate(s)						
o-Terphenyl	118.0	60-130	%	1.00	05/09/2002 17:17	

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

Diesel

Geo Enviromental Technologies
Attn: Costas Orountiotis

Test Method: 8015M
Prep Method: 3510/8015M

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID:	**MW4**	Lab Sample ID:	2002-05-0136-002
Project:	Manwel Manwel	Received:	05/08/2002 17:13
		Extracted:	05/09/2002 09:42
Sampled:	05/07/2002	QC-Batch:	2002/05/09-01.10
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	ND	50	ug/L	1.00	05/09/2002 15:25	
Surrogate(s)						
o-Terphenyl	90.7	60-130	%	1.00	05/09/2002 15:25	

Submission #: 2002-05-0136

REVISED

Diesel

SEVERN TRENT SERVICES

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Geo Enviromental Technologies
Attn: Costas Orountiotis

Test Method: 8015M
Prep Method: 3510/8015M

Sample ID:	**MW5**	Lab Sample ID:	2002-05-0136-003
Project:	Manwel Manwel	Received:	05/08/2002 17:13
		Extracted:	05/09/2002 09:42
Sampled:	05/07/2002	QC-Batch:	2002/05/09-01.10
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	ND	50	ug/L	1.00	05/09/2002 16:02	
Surrogate(s)						
o-Terphenyl	96.3	60-130	%	1.00	05/09/2002 16:02	

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

Diesel

Geo Enviromental Technologies
Attn: Costas Orountiotis

Test Method: 8015M
Prep Method: 3510/8015M

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID: **MW6**
Project: Manwel
Manwel

Sampled: 05/07/2002
Matrix: Water

Lab Sample ID: 2002-05-0136-004
Received: 05/08/2002 17:13

Extracted: 05/09/2002 09:42
QC-Batch: 2002/05/09-01.10

Sample/Analysis Flag: rl (See Legend & Note section)

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	ND	67	ug/L	1.33	05/09/2002 16:39	
Surrogate(s)						
o-Terphenyl	94.9	60-130	%	1.33	05/09/2002 16:39	

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

Diesel

Geo Enviromental Technologies
Attn: Costas Orountiotis

Test Method: 8015M
Prep Method: 3510/8015M

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID: **EX1**
Project: Manwel
Manwel

Sampled: 05/07/2002
Matrix: Water
Sample/Analysis Flag: rt (See Legend & Note section)

Lab Sample ID: 2002-05-0136-005
Received: 05/08/2002 17:13

Extracted: 05/09/2002 09:42
QC-Batch: 2002/05/09-01.10

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Diesel	560	60	ug/L	1.19	05/09/2002 17:17	ndp
Surrogate(s)						
o-Terphenyl	92.8	60-130	%	1.19	05/09/2002 17:17	

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Diesel

Batch QC report

Test Method: 8015M

Prep Method: 3510/8015 M

Method Blank | **Water** | **QC Batch # 2002/05/09-01.10**

MB: 2002/05/09-01.10-001

Date Extracted: 05/09/2002 09:42

Compound	Result	Rep.Limit	Unit	Analyzed	Flag
Diesel	ND	50	ug/L	05/09/2002 15:24	
Surrogate(s)					
o-Terphenyl	112.7	60-130	%	05/09/2002 15:24	

Submission #: 2002-05-0136

REVISED

SEVERN TRENT SERVICES

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Diesel

Batch QC report

Test Method: 8015M Prep Method: 3510/8015M

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 2002/05/09-01.10**

LCS: 2002/05/09-01.10-002 Extracted: 05/09/2002 09:42 Analyzed: 05/09/2002 16:02

LCSD: 2002/05/09-01.10-003 Extracted: 05/09/2002 09:42 Analyzed: 05/09/2002 16:39

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recover	RPD	LCS	LCSD
Diesel	1060	1090	1250	1250	84.8	87.2	2.8	60-130	25		
Surrogate(s)											
o-Terphenyl	24.2	24.8	20.0	20.0	121.1	124.2		60-130	0		

SEVERN TRENT SERVICES

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Diesel

Legend & Notes

Test Method: 8015M Prep Method: 3510/8015M

Analysis Flags

rl

Reporting limits raised due to reduced sample size.

Analyte Flags

ndp

Hydrocarbon reported does not match the pattern of our Diesel standard

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

Gas/BTEX by 8015M/8021

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Geo Enviromental Technologies	✉ 3275 Stevens Creek Blvd #208 San Jose, CA 95117
Attn: Costas Orountiotis	Phone: (408) 241-1798 Fax: (408) 248-7685
Manwel	Project: Manwel

Samples Reported

Sample ID	Matrix	Date Sampled	Lab #
MW2	Water	05/07/2002	1
MW4	Water	05/07/2002	2
MW5	Water	05/07/2002	3
MW6	Water	05/07/2002	4
EX1	Water	05/07/2002	5

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

Gas/BTEX by 8015M/8021

Geo Enviromental Technologies

Attn: Costas Orountiotis

Test Method: 8015M 8021B

Prep Method: 5030

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID: **MW2**
Project: Manwel
Manwel

Sampled: 05/07/2002
Matrix: Water

Lab Sample ID: 2002-05-0136-001
Received: 05/08/2002 17:13

Extracted: 05/09/2002 17:57
QC-Batch: 2002/05/09-01.02

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	400	50	ug/L	1.00	05/09/2002 17:57	g
Benzene	5.4	0.50	ug/L	1.00	05/09/2002 17:57	
Toluene	ND	0.50	ug/L	1.00	05/09/2002 17:57	
Ethyl benzene	1.9	0.50	ug/L	1.00	05/09/2002 17:57	
Xylene(s)	2.3	0.50	ug/L	1.00	05/09/2002 17:57	
MTBE	230	5.0	ug/L	1.00	05/09/2002 17:57	e
Surrogate(s)						
Trifluorotoluene	76.7	58-124	%	1.00	05/09/2002 17:57	
4-Bromofluorobenzene-FID	78.4	50-150	%	1.00	05/09/2002 17:57	

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

Gas/BTEX by 8015M/8021

Geo Enviromental Technologies

Attn: Costas Orountiotis

Test Method: 8015M 8021B

Prep Method: 5030

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID:	**MW4**	Lab Sample ID:	2002-05-0136-002
Project:	Manwel Manwel	Received:	05/08/2002 17:13
		Extracted:	05/09/2002 22:13
Sampled:	05/07/2002	QC-Batch:	2002/05/09-01.02
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	150	50	ug/L	1.00	05/09/2002 22:13	g
Benzene	3.5	0.50	ug/L	1.00	05/09/2002 22:13	
Toluene	ND	0.50	ug/L	1.00	05/09/2002 22:13	
Ethyl benzene	ND	0.50	ug/L	1.00	05/09/2002 22:13	
Xylene(s)	ND	0.50	ug/L	1.00	05/09/2002 22:13	
MTBE	48	5.0	ug/L	1.00	05/09/2002 22:13	
Surrogate(s)						
Trifluorotoluene	69.9	58-124	%	1.00	05/09/2002 22:13	
4-Bromofluorobenzene-FID	78.3	50-150	%	1.00	05/09/2002 22:13	

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

Gas/BTEX by 8015M/8021

Geo Enviromental Technologies

Test Method: 8015M
8021B

Attn: Costas Orountiotis

Prep Method: 5030

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID: **MW5**
Project: Manwel
Manwel

Sampled: 05/07/2002
Matrix: Water

Lab Sample ID: 2002-05-0136-003
Received: 05/08/2002 17:13

Extracted: 05/09/2002 18:29
QC-Batch: 2002/05/09-01.02

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	140	50	ug/L	1.00	05/09/2002 18:29	g
Benzene	ND	0.50	ug/L	1.00	05/09/2002 18:29	
Toluene	ND	0.50	ug/L	1.00	05/09/2002 18:29	
Ethyl benzene	ND	0.50	ug/L	1.00	05/09/2002 18:29	
Xylene(s)	ND	0.50	ug/L	1.00	05/09/2002 18:29	
MTBE	110	5.0	ug/L	1.00	05/09/2002 18:29	
Surrogate(s)						
Trifluorotoluene	73.5	58-124	%	1.00	05/09/2002 18:29	
4-Bromofluorobenzene-FID	77.6	50-150	%	1.00	05/09/2002 18:29	

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

Gas/BTEX by 8015M/8021

Geo Enviromental Technologies

Test Method: 8015M
8021B

Attn: Costas Orountiotis

Prep Method: 5030

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID:	**MW6**	Lab Sample ID:	2002-05-0136-004
Project:	Manwel Manwel	Received:	05/08/2002 17:13
		Extracted:	05/09/2002 19:01
Sampled:	05/07/2002	QC-Batch:	2002/05/09-01.02
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	ND	50	ug/L	1.00	05/09/2002 19:01	
Benzene	ND	0.50	ug/L	1.00	05/09/2002 19:01	
Toluene	ND	0.50	ug/L	1.00	05/09/2002 19:01	
Ethyl benzene	ND	0.50	ug/L	1.00	05/09/2002 19:01	
Xylene(s)	ND	0.50	ug/L	1.00	05/09/2002 19:01	
MTBE	ND	5.0	ug/L	1.00	05/09/2002 19:01	
Surrogate(s)						
Trifluorotoluene	67.7	58-124	%	1.00	05/09/2002 19:01	
4-Bromofluorobenzene-FID	68.3	50-150	%	1.00	05/09/2002 19:01	

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

Gas/BTEX by 8015M/8021

Geo Enviromental Technologies

Test Method: 8015M
8021B

Attn: Costas Orountiotis

Prep Method: 5030

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Sample ID:	**EX1**	Lab Sample ID:	2002-05-0136-005
Project:	Manwel Manwel	Received:	05/08/2002 17:13
		Extracted:	05/10/2002 18:09
Sampled:	05/07/2002	QC-Batch:	2002/05/10-01.05
Matrix:	Water		

Compound	Result	Rep.Limit	Units	Dilution	Analyzed	Flag
Gasoline	7700	2500	ug/L	50.00	05/10/2002 18:09	dp
Benzene	320	25	ug/L	50.00	05/10/2002 18:09	
Toluene	ND	25	ug/L	50.00	05/10/2002 18:09	
Ethyl benzene	66	25	ug/L	50.00	05/10/2002 18:09	
Xylene(s)	150	25	ug/L	50.00	05/10/2002 18:09	
MTBE	6200	5.0	ug/L	1.00	05/10/2002 18:09	
Surrogate(s)						
Trifluorotoluene	75.2	58-124	%	50.00	05/10/2002 18:09	
4-Bromofluorobenzene-FID	65.7	50-150	%	50.00	05/10/2002 18:09	

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Gas/BTEX by 8015M/8021

Batch QC report

Test Method: 8015M
8021B

Prep Method: 5030

Method Blank **Water** **QC Batch # 2002/05/09-01.02**

MB: 2002/05/09-01.02-003 Date Extracted: 05/09/2002 08:41

Compound	Result	Rep.Limit	Unit	Analyzed	Flag
Gasoline	ND	50	ug/L	05/09/2002 08:41	
Benzene	ND	0.5	ug/L	05/09/2002 08:41	
Toluene	ND	0.5	ug/L	05/09/2002 08:41	
Ethyl benzene	ND	0.5	ug/L	05/09/2002 08:41	
Xylene(s)	ND	0.5	ug/L	05/09/2002 08:41	
MTBE	ND	5.0	ug/L	05/09/2002 08:41	
Surrogate(s)					
Trifluorotoluene	95.8	58-124	%	05/09/2002 08:41	
4-Bromofluorobenzene-FID	104.8	50-150	%	05/09/2002 08:41	

Submission #: 2002-05-0136

REVISED

SEVERN TRENT SERVICES

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Gas/BTEX by 8015M/8021

Batch QC report

Test Method: 8015M
8020

Prep Method: 5030

Method Blank **Water** **QC Batch # 2002/05/10-01.05**

MB: 2002/05/10-01.05-005 Date Extracted: 05/10/2002 11:16

Compound	Result	Rep.Limit	Unit	Analyzed	Flag
Gasoline	ND	50	ug/L	05/10/2002 11:16	
Benzene	ND	0.5	ug/L	05/10/2002 11:16	
Toluene	ND	0.5	ug/L	05/10/2002 11:16	
Ethyl benzene	ND	0.5	ug/L	05/10/2002 11:16	
Xylene(s)	ND	0.5	ug/L	05/10/2002 11:16	
MTBE	ND	5.0	ug/L	05/10/2002 11:16	
Surrogate(s)					
Trifluorotoluene	94.5	58-124	%	05/10/2002 11:16	
4-Bromofluorobenzene-FID	71.8	50-150	%	05/10/2002 11:16	

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Gas/BTEX by 8015M/8021

Batch QC report

Test Method: 8021B Prep Method: 5030

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 2002/05/09-01.02**

LCS: 2002/05/09-01.02-004 Extracted: 05/09/2002 09:13 Analyzed: 05/09/2002 09:13

LCSD: 2002/05/09-01.02-005 Extracted: 05/09/2002 09:45 Analyzed: 05/09/2002 09:45

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recover	RPD	LCS	LCSD
Benzene	96.8	93.2	100.0	100.0	96.8	93.2	3.8	77-123	20		
Toluene	97.5	93.8	100.0	100.0	97.5	93.8	3.9	78-122	20		
Ethyl benzene	101	98.5	100.0	100.0	101.0	98.5	2.5	70-130	20		
Xylene(s)	297	290	300	300	99.0	96.7	2.4	75-125	20		
Surrogate(s)											
Trifluorotoluene	490	462	500	500	98.0	92.4		58-124			

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Gas/BTEX by 8015M/8021

Batch QC report

Test Method: 8015M Prep Method: 5030

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 2002/05/09-01.02**

LCS: 2002/05/09-01.02-008 Extracted: 05/09/2002 11:40 Analyzed: 05/09/2002 11:40

LCSD: 2002/05/09-01.02-007 Extracted: 05/09/2002 10:49 Analyzed: 05/09/2002 10:49

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recover	RPD	LCS	LCSD
Gasoline	517	458	500	500	103.4	91.6	12.1	75-125	20		
Surrogate(s)											
4-Bromofluorobenzene	537	506	500	500	107.4	101.2		50-150			

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Gas/BTEX by 8015M/8021

Batch QC report

Test Method: 8020 Prep Method: 5030

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 2002/05/10-01.05**

LCS: 2002/05/10-01.05-006 Extracted: 05/10/2002 11:48 Analyzed: 05/10/2002 11:48

LCSD: 2002/05/10-01.05-007 Extracted: 05/10/2002 12:20 Analyzed: 05/10/2002 12:20

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recover	RPD	LCS	LCSD
Benzene	99.2	102	100.0	100.0	99.2	102.0	2.8	77-123	20		
Toluene	99.4	103	100.0	100.0	99.4	103.0	3.6	78-122	20		
Ethyl benzene	96.5	99.1	100.0	100.0	96.5	99.1	2.7	70-130	20		
Xylene(s)	289	295	300	300	96.3	98.3	2.1	75-125	20		
Surrogate(s)											
Trifluorotoluene	479	494	500	500	95.8	98.8		58-124			

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Gas/BTEX by 8015M/8021

Batch QC report

Test Method: 8015M
8020

Prep Method: 5030

Laboratory Control Spike (LCS/LCSD) **Water** **QC Batch # 2002/05/10-01.05**

LCS: 2002/05/10-01.05-008 Extracted: 05/10/2002 12:52 Analyzed: 05/10/2002 12:52

LCSD: 2002/05/10-01.05-009 Extracted: 05/10/2002 13:24 Analyzed: 05/10/2002 13:24

Compound	Conc. [ug/L]		Exp.Conc. [ug/L]		Recovery		RPD	Ctrl.Limits [%]		Flags	
	LCS	LCSD	LCS	LCSD	LCS	LCSD	[%]	Recover	RPD	LCS	LCSD
Gasoline	539	540	500	500	107.8	108.0	0.2	75-125	20		
Surrogate(s)											
4-Bromofluorobenzene	386	390	500	500	77.2	78.0		50-150			

REVISED

Submission #: 2002-05-0136

SEVERN TRENT SERVICES

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com

CA DHS ELAP#1094

Gas/BTEX by 8015M/8021

Legend & Notes

Test Method: 8015M
8021B

Prep Method: 5030

Analyte Flags

dp

Sample contains discrete peak in addition to gasoline.

Analyte Flags

e

Estimated value. The concentration exceeded the calibration of analysis.

Analyte Flags

g

Hydrocarbon reported in the gasoline range does not match our gasoline standard

66253

SEVERN TRENT SERVICES

Sample Receipt Checklist

STL San Francisco

Client Name: _____ Date/Time Received: _____ Date / Time

Reference/Subm #: 2002-05-0136 Received by: _____

Checklist completed by: C Rowley 05/09/02 Signature / Date Reviewed By: _____ Initial/Date

Matrix: ☐ Soil ☑ Water ☐ Other _____ Carrier name: Client – STL SF - _____

Shipping container/cooler in good condition?	Yes ✓	No ___	Not Present ___
Custody seals intact on shipping container/cooler?	Yes ___	No ___	Not Present ✓
Custody seals intact on sample bottles?	Yes ___	No ___	Not Present ✓
Chain of custody present?	Yes ✓	No ___	
Chain of custody signed when relinquished and received?	Yes ✓	No ___	
Chain of custody agrees with sample labels?	Yes ✓	No ___	
Samples in proper container/bottle?	Yes ✓	No ___	
Sample containers intact?	Yes ✓	No ___	
Sufficient sample volume for indicated test?	Yes ✓	No ___	
All samples received within holding time?	Yes ✓	No ___	
Container/Temp Blank temperature in compliance?	Temp: 4.0 °C	Yes ✓	No ___
Water - VOA vials have zero headspace?	No VOA vials submitted ___	Yes ✓	No ___

Water - **pH acceptable upon receipt?** ☐ Yes ☐ No ☐ Checked by VOA chemist

☐ **pH adjusted**– Preservative used: ☐ HNO_3 ☐ HCl ☐ H_2SO_4 ☐ NaOH ☐ ZnOAc **Lot#**(s) _____

Any No and/or NA (not applicable) response must be detailed in the comments section below.

==========

Client contacted: _____ Date contacted: _____ Person contacted: _____

Contacted by: _____ Regarding: _____

Comments: _____

_____

_____

Corrective Action: _____

_____

Submission #: 2002-05-0136 REVISED Date: May 13, 2002

SEVERN TRENT SERVICES

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566

Tel 925 484 1919
Fax 925 484 1096
www.stl-inc.com
www.chromalab.com
CA DHS ELAP#1094

Geo Enviromental Technologies

3275 Stevens Creek Blvd
#208
San Jose, CA 95117

Attn: Mr. Costas Orountiotis

Project: Manwel
Manwel

Dear Mr. Orountiotis

Attached is our report for your samples received on Wednesday May 8, 2002
This report has been reviewed and approved for release. Reproduction of this report is permitted only in its entirety.

Please note that any unused portion of the samples will be discarded after June 22, 2002 unless you have requested otherwise.
We appreciate the opportunity to be of service to you. If you have any questions, please call me at (925) 484-1919.
You can also contact me via email. My email address is: vvancil@chromalab.com

Sincerely,

Vincent Vancil
Project Manager