



Technology, Engineering & Construction, Inc.

35 South Linden Ave. • So. San Francisco, CA 94080-6407 • Contractor's Lic. #762034
Tel: (650) 952-5551 • Fax: (650) 952-7631 • www.tecaccutite.com

May 30, 2003

Mr. Amir Gholami
Hazardous Materials Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Ro/03

**SUBJECT: SOIL VAPOR INVESTIGATION REPORT
MAY 2003**

*Alameda County
JUN 05 2003
Environmental Health*

**SITE: FORMER OLYMPIAN STATION
1435 Webster Street
Alameda, California.**

Dear Mr. Gholami:

On behalf of responsible parties, TEC Accutite is pleased to submit this soil vapor investigation report for the above referenced site.

Thank you for your cooperation and assistance on this project. If you have any questions, please call the undersigned at (650) 952-5551, Ext. 208.

Sincerely,
TEC Accutite

David Gregory, R.G.
Project Manager

cc: Mr. Dan Koch, Olympian, 260 Michelle Court, South San Francisco, CA 94080.
Mr. David Harris, Esq., Trump, Alioto, Trump & Prescott, LLP, 2280 Union Street, San Francisco, CA 94123
Mr. Jeff Farrar, P.O. Box 1701, Chico, CA 95927
Mr. Thomas Ballard, GHH Engineering, Inc., 11960 Heritage Oak Place, Suite 2B, Auburn, CA 95603

*Alameda County
JUN 05 2003
Environmental Health*

**SOIL VAPOR INVESTIGATION REPORT
MAY 2003**

**FORMER OLYMPIAN STATION
ALAMEDA, CA**

PREPARED FOR:

**OLYMPIAN
AND
ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY**

MAY 30, 2003



TABLE OF CONTENTS

	<u>PAGE</u>
1.0 <u>INTRODUCTION</u>	1
2.0 <u>SITE DESCRIPTION</u>	1
3.0 <u>ENVIRONMENTAL BACKGROUND</u>	1
4.0 <u>SCOPE OF WORK</u>	2
5.0 <u>RESULTS</u>	3
6.0 <u>CONCLUSIONS & RECOMMENDATIONS</u>	3
7.0 <u>LIMITATIONS</u>	4

TABLE

1. SUMMARY OF SOIL VAPOR ANALYTICAL DATA

FIGURES

1. VICINITY MAP
2. SITE MAP
3. SOIL VAPOR SAMPLE LOCATIONS

ATTACHMENTS

- A LABORATORY REPORTS



TABLE 1: Summary of Soil Vapor Analytical Data - Former Olympian Station, 1435 Webster Street, Alameda, CA

Sample ID	Sample Depth (fkg)	Sample Date	TPH	B	T	E	X (mp)	MTBE	TBA	DIPE	ETBE	TAME	Freon 11	Freon 12
Concentrations in mg/m ³														
SV1	3.5	05/14/03	5.4	<1	1.9	<1	<1	<1	<5	<1	<1	<1	<1	1
SV-2	3.5	05/14/03	<1	<1	<1	<1	<1	<1	<5	<1	<1	<1	1.5	1.4
SV-3	3.5	05/14/03	5.8	<1	3.7	<1	<1	<1	<5	<1	<1	<1	<1	<1
SV-4	3.5	05/14/03	<1	<1	<1	<1	<1	<1	<5	<1	<1	<1	<1	<1
SV-5	3.5	05/14/03	<1	<1	<1	<1	<1	<1	<5	<1	<1	<1	8.7	7.9
SV-6	3.5	05/14/03	<1	<1	<1	<1	<1	<1	<5	<1	<1	<1	1.1	1.9
SV-7	3.5	05/14/03	<1	<1	<1	<1	<1	<1	<5	<1	<1	<1	<1	<1
	3.5dup	05/14/03	<1	<1	<1	<1	<1	<1	<5	<1	<1	<1	<1	<1
RBSLres (mg/m3)					1,200									

TPH = Total petroleum hydrocarbons by EPA method 8015M

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes by EPA Method 8260B

Freon 11 = Trichlorofluoromethane by EPA Method 8260B

Freon 12 = Dichlorodifluoromethane by EPA Method 8260B

TBA = Tert-Butanol by EPA Method 8260B

MTBE = Methyl-tert-butyl ether by EPA Method 8260B

DIPE = Diisopropyl ether by EPA Method 8260B

ETBE = Ethyl-tert-butyl ether by EPA Method 8260B

TAME = Tert-amyl methyl ether by EPA Method 8260B

<x = compound not detected above laboratory reporting limits

RBSLres= Soil gas screening level for protection of indoor air, (emissions from impacted groundwater) assuming coarse soils and residential land use (CRWQCB Interim Final, December 2001, Table E-2b)

1.0 INTRODUCTION

On behalf of Olympian, TEC Accutite conducted a soil vapor investigation at the former Olympian Station located at 1435 Webster Street, Alameda, California. The objective of the investigation was to evaluate potential inhalation risk posed by benzene vapors emanating off impacted groundwater. Presented below are the site background and results of the investigation. A site vicinity map and site map are presented as Figures 1 & 2, respectively.

2.0 SITE DESCRIPTION

The site is located on the corner of Webster Street and Taylor Avenue in Alameda, CA. Prior to 1989, the site was occupied by an Olympian Service Station. Station facilities consisted of two 10,000-gallon gasoline and one 7,500-gallon diesel underground storage tanks (USTs), two dispenser islands and a 500-gallon waste oil UST.

The surrounding topography is flat and the site is approximately 20 feet above mean sea level. The site is situated in a mixed commercial and residential area and is currently leased by the City of Alameda and operated as a metered parking lot.

3.0 ENVIRONMENTAL BACKGROUND

October 1988, Soil Gas Sampling: CHIPS Environmental Consultants, Inc. performed soil gas analysis at the subject site. High soil gas readings were found on the eastern side of one of the pump islands, between the pump islands, and from backfill between the gasoline storage tanks.

September 1989, UST Removal: TEC Accutite removed the following USTs:

- Two 10,000-gallon gasoline USTs
- One 7,500-gallon diesel UST
- One 500-gallon waste oil UST

Analysis of soil samples collected during removal of the USTs detected hydrocarbons at a maximum concentration of 220 parts per million (ppm) Total Petroleum Hydrocarbons as gasoline (TPHg), 430 ppm Total Petroleum Hydrocarbons as diesel (TPHd), and 650 ppm Total Recoverable Petroleum Hydrocarbons as Oil and Grease (TRPH).

January 1991, Soil Excavation: Excavation of the hydrocarbon impacted soil was conducted by AAA Tank Removal / Forcade Excavations Services. Approximately 950 cubic yards of soil were removed from the former location of the USTs. This soil was bioremediated onsite and returned to the former excavation.

January 1993, Well Installation: Uriah Environmental Services, Inc. installed three groundwater monitoring wells onsite (MW-1 through MW-3). Soil samples collected during the well installation did not detect petroleum hydrocarbons at concentrations above laboratory reporting limits. Bi-annual groundwater monitoring was initiated. Dissolved phase hydrocarbons were detected in all wells at varying concentrations.

February 1999, Soil Borings: TEC Accutite advanced four borings on and offsite (B1 through B4) to determine the extent of hydrocarbon impact to soil and groundwater. Petroleum hydrocarbons were detected in soil at concentrations just above laboratory reporting limits. Petroleum hydrocarbons were detected in groundwater at concentrations up to 6,000 parts per billion (ppb) MTBE and 38,000 ppb benzene.



December 1999, Well Installation: TEC Accutite installed three additional wells MW-4 through MW-6. Analysis of soil samples detected petroleum hydrocarbons at maximum concentrations of 1,100 ppm TPHg, 200 ppm TPHd and 3.4 ppm benzene in soil 9.5 feet below grade (fbg) from well MW-5. No hydrocarbons were detected in soil samples collected during the installation of wells MW-4 and MW-6. Groundwater sampling from wells MW-6 and MW-3 defined the dissolved phase hydrocarbon plume upgradient of the former dispenser islands and cross-gradient of the former USTs.

November 2000, Site Conceptual Model: TEC Accutite completed a site conceptual model (SCM). Based on historical quarterly monitoring data, it was determined that the contaminant plume was not defined downgradient. An assessment of hydrogeological conditions, proximity to sensitive receptors and current groundwater usage, suggest that MTBE in groundwater is not the primary chemical of concern. Given the shallow groundwater elevation (9 fbg), estimated high permeability of soils beneath the site, the potential for benzene vapor phase migration from hydrocarbon impacted groundwater to indoor and ambient air was identified as an exposure pathway requiring further evaluation.

June 2001, Soil Borings: TEC Accutite drilled four soil borings to assess the extent of the dissolved phase hydrocarbons downgradient of the site. Soil samples were collected approximately 9 fbg within the capillary fringe from soil borings B1 through B4. Petroleum hydrocarbons were not detected in soil at concentrations above laboratory reporting limits. The greatest concentrations of dissolved phase petroleum hydrocarbons were detected in monitoring well MW-1 (18,000 ppb TPHg, 1,200 ppb benzene, and 1,500 ppb MTBE). Dissolved phase concentrations of TPHg, benzene, and MTBE in surrounding monitoring wells were either non-detect or just above laboratory reporting limits.

February 2002, Risk Assessment: To address the potential exposure pathway identified in the SCM, TEC Accutite performed a site-specific risk assessment. The risk assessment addressed the potential inhalation risk posed by hydrocarbon impacted groundwater beneath the site assuming both residential and commercial land use scenarios. The compounds of concern were identified as TPHg and benzene. TPHg was assessed using the TPH fractional methodology developed by TPH Criteria Working Group. The calculated annual regional mean concentrations for benzene and TPHg were 2,988 ppb and 23,137 ppb, respectively. The results of the risk assessment found that concentrations of TPHg in groundwater beneath the site were below the calculated site specific target level concentrations (SSTL's) for residential and commercial scenarios. Therefore, TPHg remaining in groundwater beneath the site does not present an inhalation risk. Benzene concentrations in groundwater exceed the SSTL for a residential scenario (110 ppb) but are less than the SSTL for a commercial scenario (6400 ppb).

The results of the risk assessment suggest that benzene in groundwater beneath the site may present an inhalation risk, assuming residential land use. The risk assessment was based on the Johnson & Ettinger Vapor Fate and Transport Model, which often overestimates actual vapor concentrations at the point of exposure by factors of 10 to 100. Rather than proceed with site closure under restricted commercial land use, a soil vapor survey was recommended to validate the exposure pathway.

4.0 SCOPE OF WORK

In the February 2002, Risk Assessment benzene concentrations in groundwater exceeded the 1×10^{-6} risk factor for inhalation exposure should the site be developed for residential use. Although concentrations in groundwater do not present a risk for commercial land-use, a deed restriction would be placed on the property excluding it from residential development in the future without further investigation. Rather than proceed with a deed restriction, a soil vapor survey was conducted to determine whether the vapor exposure pathway was valid. Details of the investigation are outlined below.



Project Personnel: Registered Geologist David Gregory conducted all fieldwork RG# 7301

Permits: No permits required

Sampling Co: Transglobal Environmental Geochemistry

Onsite Laboratory: Transglobal Environmental Geochemistry, California State Certified

Sampling Date: May 13, 2003.

Number of Samples: Eight, SV1 – SV7, duplicate sample SV7

Sample Depth: Vapor samples were collected at 3.5 fbg

Sample Technique: A 1-inch diameter chrome-moly steel probe equipped with a steel drop off tip was inserted into the ground to a depth of 4 fbg. The probe was driven into the ground by an electric rotary hammer. At the surface a bentonite seal was placed around the steel probe. A 1/8-inch nylaflow tube runs down the center of the probe to the sampling ports. Once the probe was inserted to the desired depth, the probe was retracted 6 inches, opening the tip and exposing the sample ports. Soil vapor was withdrawn using a small calibrated syringe connected via an on-off valve. The volume of air in the lines was calculated so that the first five dead volumes of gas were purged. Purging ensures the sample tubing was flushed and filled with in-situ soil vapor prior to sample collection. After purging, the next 20 cubic centimeters of soil vapor was withdrawn into the syringe, plugged and immediately transferred to the onsite lab (State Certified) for analysis.

Laboratory Analysis: Soil vapor samples were analyzed for VOCs by EPA Method 8260B. Total Petroleum Hydrocarbons (TPH) were analyzed by EPA Method 8015M. A copy of the laboratory report is presented in Attachment A.

5.0 RESULTS

Petroleum hydrocarbons TPH and Toluene were detected at concentrations of 5.4 ppmV and 1.9 mg/m³, and, 5.8 ppmV and 3.7 mg/m³ in soil vapor from sample locations SV-1 and SV-3, respectively (Table 1). No other petroleum hydrocarbon compounds were detected in soil vapor at concentrations above laboratory reporting limits.

Chlorofluorocarbons (CFCs), Trichlorofluoromethane and Dichlorodifluoromethane, also known as Freon 11 and Freon 12 were detected in soil vapor collected from sample locations SV1, SV2, SV5 and SV6. Freon 11 and Freon 12 were detected at maximum concentrations of 8.7 mg/m³ and 7.9 mg/m³ in soil vapor collected from sample location SV-5.

6.0 CONCLUSIONS & RECOMMENDATIONS

- ◆ The origin of CFCs in soil gas is unknown. Trichlorofluoromethane and dichlorofluoromethane do not present a health risk as they were detected at concentrations significantly below the OSHA permissible exposure limit (PEL) of 5,600 mg/m³ and 4,950 mg/m³ as an 8-hour time-weighted average concentration.



- ◆ Inhalation risk associated with exposure to benzene vapors emanating off impacted groundwater beneath the site has been evaluated and determined to be an invalid exposure pathway.
- ◆ Toluene was detected in soil gas at concentrations significantly below the Regional Water Quality Control Board (San Francisco Bay Region) Soil Gas Risk Based Screening Level of 1,200 mg/m³, therefore presents no inhalation risk.
- ◆ TPH was detected in soil gas at concentrations just above laboratory detection limits. The absence of "indicator compounds" used to evaluate risk associated with TPH is sufficient to conclude TPH presents no inhalation risk.

In summary, all exposure pathways relevant to petroleum hydrocarbons which remain in groundwater beneath the site have been evaluated. Petroleum hydrocarbons in groundwater present no risk to public health and the environment. The dissolved phase plume has been determined to be stable and should be left up to the processes of natural attenuation to restore groundwater quality. TEC Accutite requests to proceed with case closure for unrestricted land-use.

7.0 LIMITATIONS

Our services consist of professional opinions, conclusions and recommendations made today in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties either expressed or implied. TEC Accutite's liability is limited to the dollar amount of the work performed.

Thank you for your cooperation with this project. If you have any questions, please call at (650) 952-5551, Ext. 208.

Sincerely,
TEC Accutite

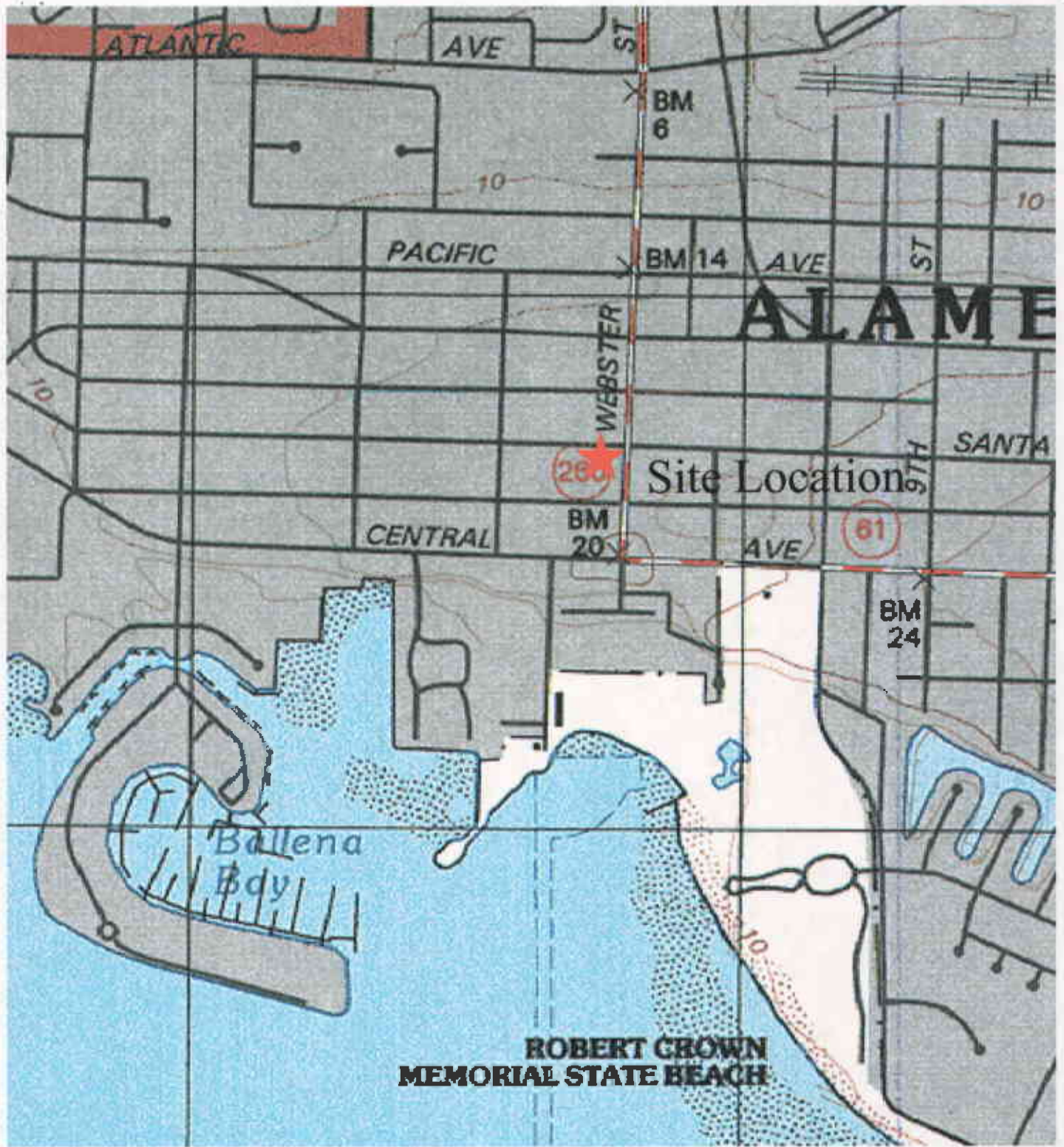


David Gregory, R.G.
Project Manager

cc: Mr. Dan Koch, Olympian, 260 Michelle Court, South San Francisco, CA 94080.
Mr. David Harris, Esq., Trump, Alioto, Trump & Prescott, LLP, 2280 Union Street, San Francisco, CA 94123
Mr. Jeff Farrar, P.O. Box 1701, Chico, CA 95927
Mr. Thomas Ballard, GHH Engineering, Inc., 11960 Heritage Oak Place, Suite 2B, Auburn, CA 95603

S:\Env. Dept\Olympian\1435 Webster\Reports\Soil Vapor RptMay03.doc

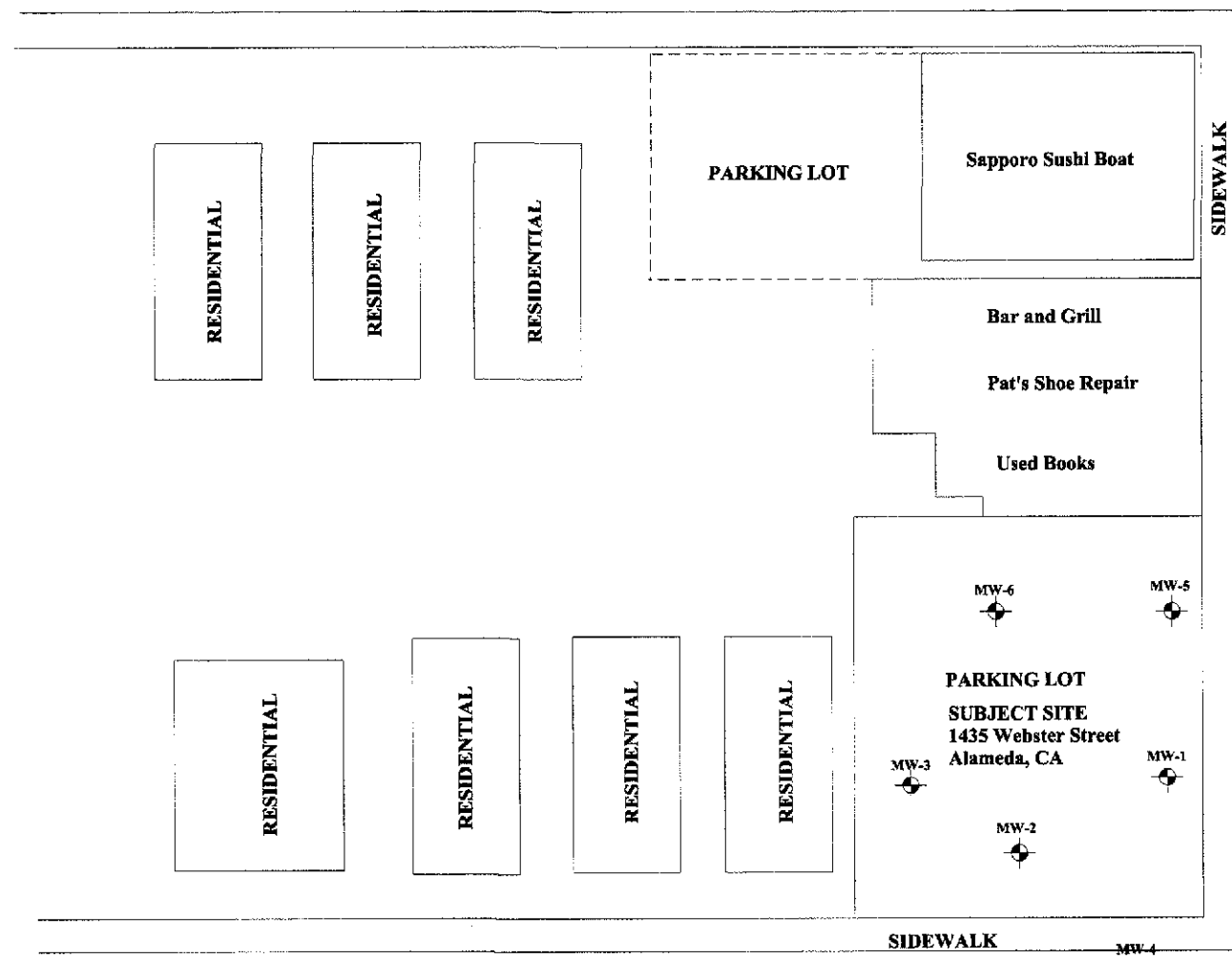




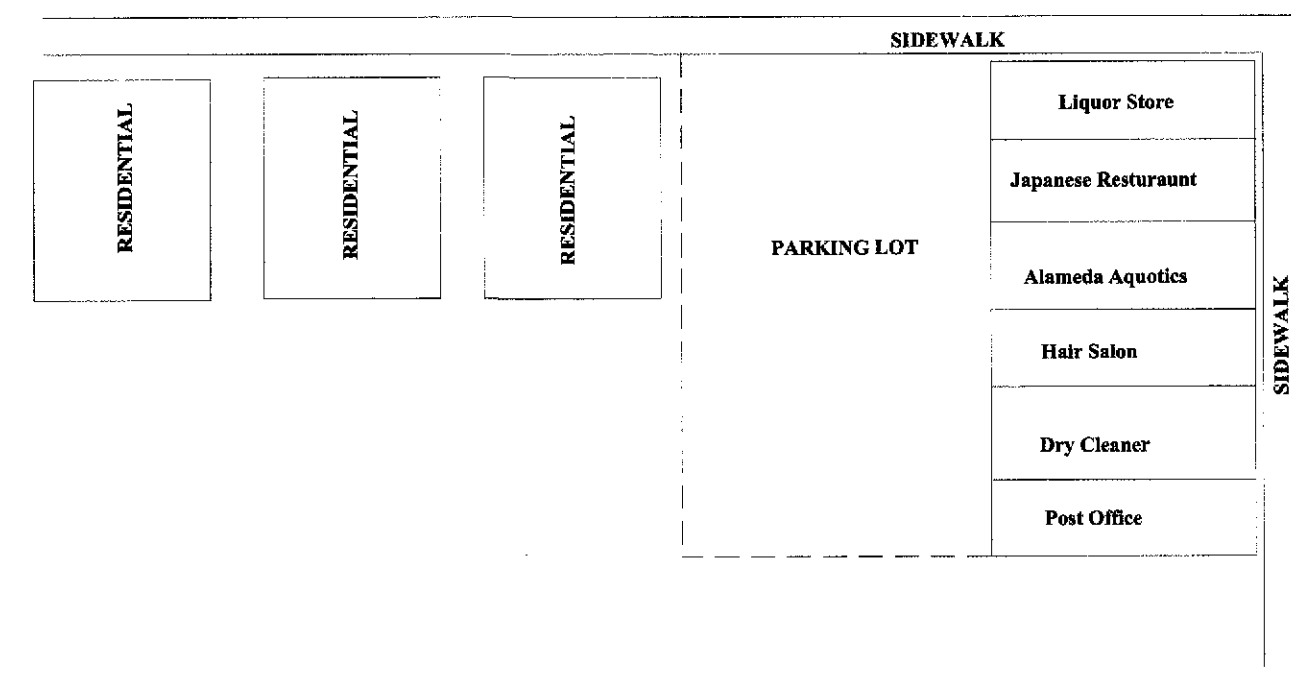
	DATE 11/17/00	PAGE 1 of 1
	SCALE: SHOWN ABOVE	
	LEGEND:	


**35 SOUTH LINDEN AVENUE
SOUTH SAN FRANCISCO**

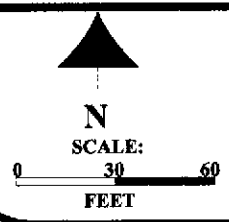
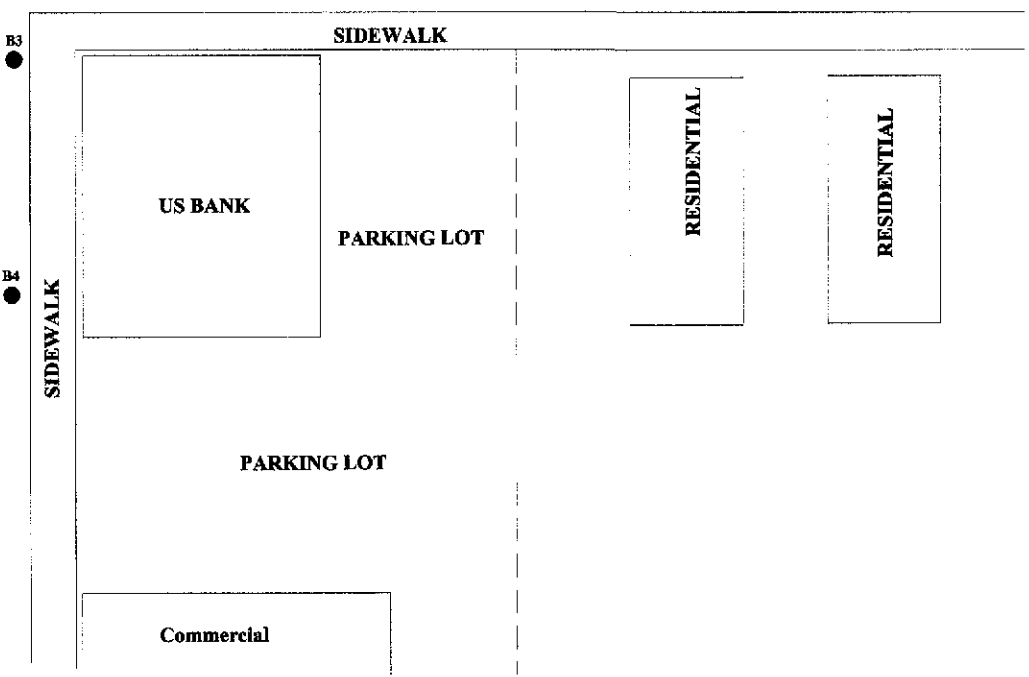
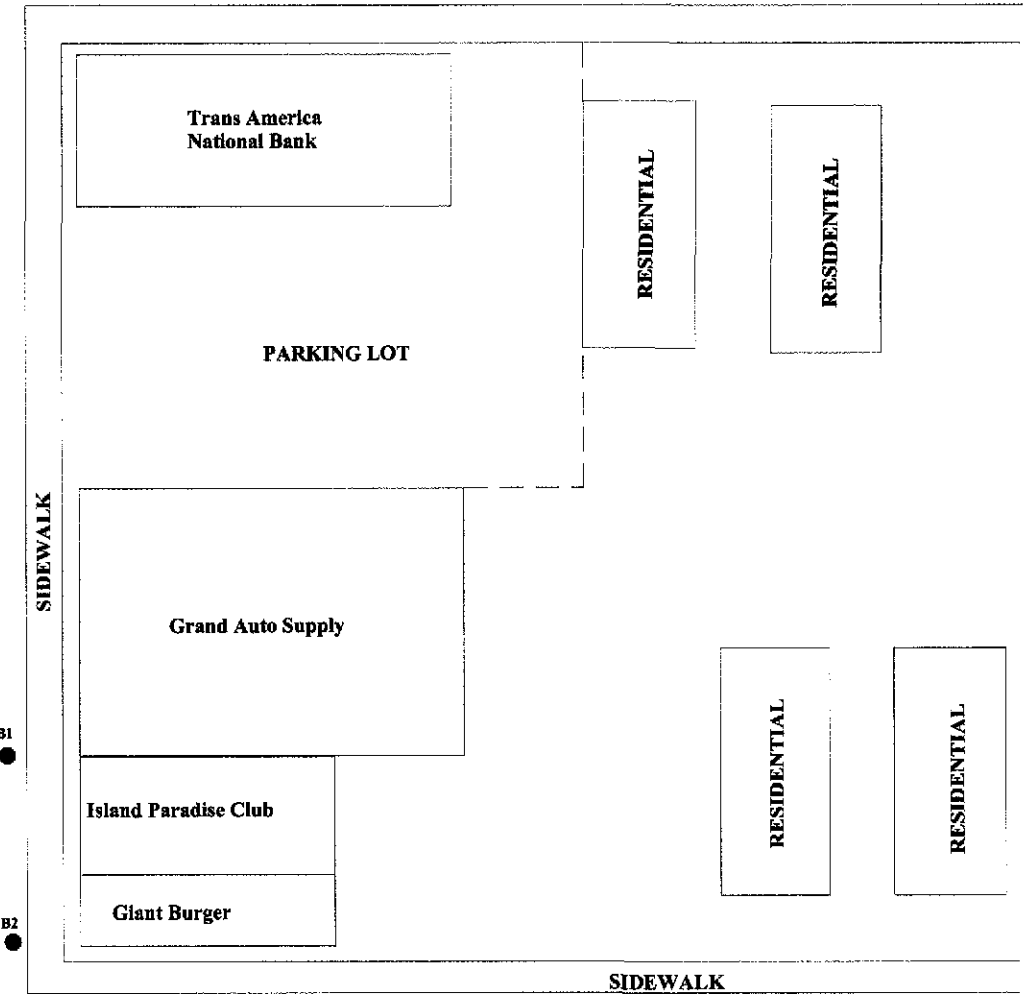
FIGURE 1
SITE VICINITY MAP
srs2.tcw
 SITE: **1435 WEBSTER STREET
ALAMEDA, CA**



TAYLOR AVENUE



WEBSTER STREET



Legend:

- Monitoring Well
- Soil boring location, July 2001

Drawn by: D Gregory

Date: 2/4/02

Lgsitemap01.tcw

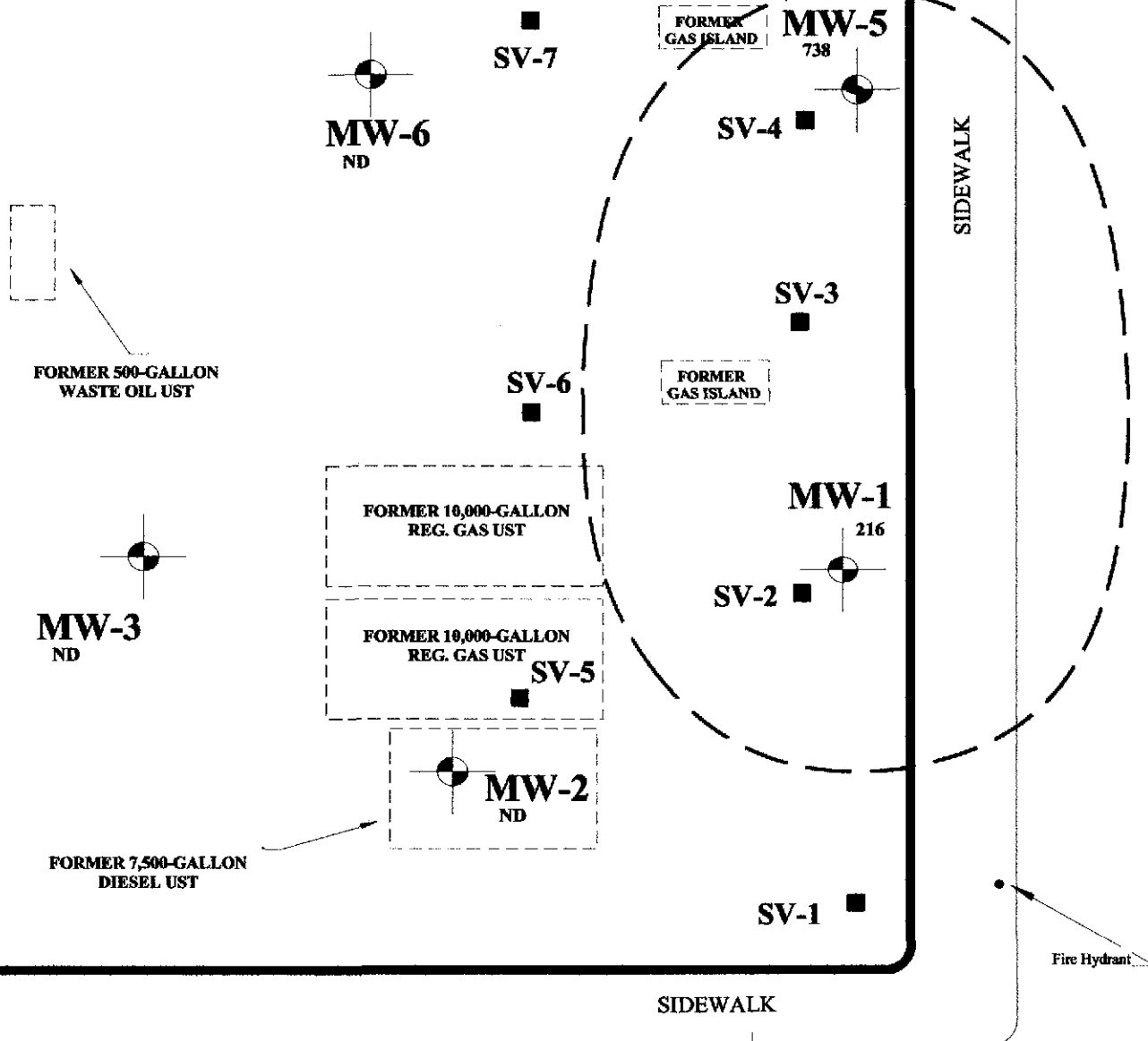
35 SOUTH LINDEN AVENUE
SOUTH SAN FRANCISCO

Former Olympian Station
1435 Webster Street,
Alameda, CA

FIGURE: 2
SITE MAP
1435 Webster Street
Alameda, CA

**PUBLIC PARKING LOT
AND FORMER GAS STATION
1435 WEBSTER STREET
ALAMEDA, CALIFORNIA**

**PROPERTY
BOUNDARY**



WEBSTER STREET

SIDEWALK

Fire Hydrant



MONITORING WELLS AND
BENZENE CONCENTRATION
DECEMBER 2001 (PPB)

1,200



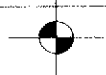
BENZENE IN GROUNDWATER
EXCEEDING THE SSTL
OF 110 PPB DECEMBER 2001



SOIL VAPOR SAMPLE LOCATIONS
COLLECTED 3.5 FBG, MAY 2003



Approximate Scale:
ONE INCH = 20 FEET



MW-4
1.6

TAYLOR AVENUE



35 SOUTH LINDEN AVENUE
SOUTH SAN FRANCISCO

FIGURE 3:

**SOIL VAPOR SAMPLE LOCATIONS
MAY 2003**

KEY:

**FORMER OLYMPIAN STATION
1435 WEBSTER STREET
ALAMEDA, CA**

ATTACHMENT A
LABORATORY REPORTS





May 28, 2003

Mr. David Gregory
TEC Accutite
35 South Linden Avenue
South San Francisco, CA 94080

SUBJECT: DATA REPORT - Webster & Taylor, Alameda, California

TEG Project # 30514E

Mr. Gregory:

Please find enclosed a data report for the samples analyzed from the above referenced project for TEC Accutite. The samples were analyzed on site in TEG's DHS certified mobile laboratory. TEG conducted a total of 16 analyses on 8 soil vapor samples.

- 8 analyses on soil vapors for volatile organic hydrocarbons by EPA method 8260B.
- 8 analyses on soil vapors for total petroleum hydrocarbons by EPA method mod8015.

The results of the analyses are summarized in the enclosed tables. Applicable detection limits and calibration data are included in the tables.

TEG appreciates the opportunity to have provided analytical services to TEC Accutite on this project. If you have any further questions relating to these data or report, please do not hesitate to contact us.

Sincerely,

Leif Jonsson
Principal Analyst, TEG-Northern California



TEC Accutite
Webster & Taylor
Alameda, California

TEG Project #30514E

BTEX, OXYGENATES, (EPA method 8260B) & TPH (EPA method 8015m) Analyses of SOIL VAPOR in ug/L of Vapor

SAMPLE NUMBER:	Blank	SV-1	SV-2	SV-3	SV-4	
SAMPLE DEPTH:		3.5	3.5	3.5	3.5	
COLLECTION DATE:	5/14/03	5/14/03	5/14/03	5/14/03	5/14/03	
COLLECTION TIME:	8:15	8:46	9:19	9:39	10:01	
DILUTION FACTOR:	1	1	1	1	1	
	RL					
Benzene	1.0 ug/L	nd	nd	nd	nd	
Toluene	1.0 ug/L	nd	1.9	nd	3.7	
Ethylbenzene	1.0 ug/L	nd	nd	nd	nd	
Total Xylenes	1.0 ug/L	nd	nd	nd	nd	
Dichlorodifluoromethane	1.0 ug/L	nd	1.0	1.4	nd	
Trichlorofluoromethane	1.0 ug/L	nd	nd	1.5	nd	
Tert-Butanol (TBA)	5.0 ug/L	nd	nd	nd	nd	
Methyl-t-butyl ether (MTBE)	1.0 ug/L	nd	nd	nd	nd	
Diisopropyl ether (DIPE)	1.0 ug/L	nd	nd	nd	nd	
Ethyl-t-butyl ether (ETBE)	1.0 ug/L	nd	nd	nd	nd	
Tert-amyl methyl ether (TAME)	1.0 ug/L	nd	nd	nd	nd	
TPH	1.0 ppmV	nd	5.4	nd	5.8	
Surrogate Recovery:						
	DBFM	111%	112%	109%	109%	108%
	1,2-DCA-d4	101%	101%	100%	100%	99%
	Toluene-d8	109%	112%	109%	111%	109%

'nd' INDICATES NOT DETECTED AT LISTED REPORTING LIMITS

'RL' INDICATES REPORTING LIMITS

ANALYSES PERFORMED IN TEG-Northern California's DHS CERTIFIED LAB

ANALYSES PERFORMED BY: Christina Leonard

DATA REVIEWED BY: Mr. Leif Jonsson

page 1



TEC Accutite
Webster & Taylor
Alameda, California

TEG Project #30514E

BTEX, OXYGENATES, (EPA method 8260B) & TPH (EPA method 8015m) Analyses of SOIL VAPOR in ug/L of Vapor

SAMPLE NUMBER:	SV-5	SV-6	SV-7	SV-7
SAMPLE DEPTH:	3.5	3.5	3.5	3.5 dup
COLLECTION DATE:	5/14/03	5/14/03	5/14/03	5/14/03
COLLECTION TIME:	10:23	10:44	11:06	11:06
DILUTION FACTOR:	1	1	1	1

	RL				
Benzene	1.0 ug/L	nd	nd	nd	nd
Toluene	1.0 ug/L	nd	nd	nd	nd
Ethylbenzene	1.0 ug/L	nd	nd	nd	nd
Total Xylenes	1.0 ug/L	nd	nd	nd	nd
Dichlorodifluoromethane	1.0 ug/L	7.9	1.9	nd	nd
Trichlorofluoromethane	1.0 ug/L	8.7	1.1	nd	nd
Tert-Butanol (TBA)	5.0 ug/L	nd	nd	nd	nd
Methyl-t-butyl ether (MTBE)	1.0 ug/L	nd	nd	nd	nd
Diisopropyl ether (DIPE)	1.0 ug/L	nd	nd	nd	nd
Ethyl-t-butyl ether (ETBE)	1.0 ug/L	nd	nd	nd	nd
Tert-amyl methyl ether (TAME)	1.0 ug/L	nd	nd	nd	nd
TPH	1.0 ppmV	nd	nd	nd	nd

Surrogate Recovery:

DBFM	106%	105%	110%	112%
1,2-DCA-d4	99%	101%	103%	102%
Toluene-d8	108%	107%	110%	109%

'nd' INDICATES NOT DETECTED AT LISTED REPORTING LIMITS

'RL' INDICATES REPORTING LIMITS

ANALYSES PERFORMED IN TEG-Northern California's DHS CERTIFIED LAB

ANALYSES PERFORMED BY: Christina Leonard

DATA REVIEWED BY: Mr. Leif Jonsson

page 2



TEC Accutite
Webster & Taylor
Alameda, California

TEG Project #30514E

CALIBRATION DATA - Calibration Check Compounds

	Vinyl Cl	1,1 DCE	Cl-Form	1,2 DCP	Toluene	Ethylbenzene
Midpoint	50.0	50.0	50.0	50.0	50.0	50.0

Continuing Calibration - Midpoint

5/14/03	43.7	49.9	49.1	48.4	49.9	50.8
	87.3%	99.8%	98.1%	96.7%	99.8%	101.5%

ANALYSES PERFORMED BY: Christina Leonard