



**CONESTOGA-ROVERS
& ASSOCIATES**

5900 Hollis Street, Suite A
Emeryville, California 94608
Telephone: (510) 420-0700 Fax: (510) 420-9170
www.CRAworld.com

TRANSMITTAL

DATE: March 27, 2013 REFERENCE NO.: 240523
PROJECT NAME: 4212 First Street, Pleasanton

TO: Flora Chan
Bay Area Air Quality Management District
Permit Services Division
939 Ellis Street
San Francisco, California 94109

RECEIVED

By Alameda County Environmental Health at 4:04 pm, Mar 27, 2013

Please find enclosed: Draft Final
 Originals Other
 Prints

Sent via: Mail Same Day Courier
 Overnight Courier Other

QUANTITY	DESCRIPTION
1	BAAQMD Authority to Construct/Permit to Operate Application

As Requested For Review and Comment
 For Your Use

COMMENTS:

If you have any questions regarding the contents of this document, please call Jeff Schrupp at (510) 385-0436.

Copy to: Denis Brown, Shell Oil Products US (electronic copy)
Jerry Wickham, Alameda County Environmental Health (electronic copy)
Douglas E. & Mary M. Safreno (property owners), 1627 Vineyard Avenue, Pleasanton, CA 94566-6389 (electronic and hard copy)
Danielle Stefani, Livermore-Pleasanton Fire Department, 3560 Nevada Street, Pleasanton, CA 94566-6267
Colleen Winey, Zone 7 Water Agency (electronic copy)
Clint Mercer (lessee), SC Fuels, 1800 West Katella Avenue, Orange, CA 92867
Aaron O'Brien, Tamalpais Environmental Consultants (electronic copy)

Completed by: Peter Schaefer Signed: *Peter Schaefer*

Filing: Correspondence File



Denis L. Brown
Shell Oil Products US
HSE - Environmental Services
20945 S. Wilmington Ave.
Carson, CA 90810-1039
Tel (707) 865 0251
Fax (707) 865 2542
Email denis.l.brown@shell.com

Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: Shell-branded Service Station
4212 First Street
Pleasanton, California
SAP Code 135782
Incident No. 98995840
ACEH Case No. RO0000360

Dear Mr. Wickham:

The attached document is provided for your review and comment. Upon information and belief, I declare, under penalty of perjury, that the information contained in the attached document is true and correct.

If you have any questions or concerns, please call me at (707) 865-0251.

Sincerely,

A handwritten signature in black ink, appearing to read "Denis L. Brown", is located below the "Sincerely," text.

Denis L. Brown
Senior Program Manager



**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
AUTHORITY TO CONSTRUCT/
PERMIT TO OPERATE APPLICATION**

**SHELL-BRANDED SERVICE STATION
4212 FIRST STREET
PLEASANTON, CALIFORNIA**

MARCH 27, 2013

REF. NO. 240523 (20)

This report is printed on recycled paper.

**Prepared by:
Conestoga-Rovers
& Associates**

5900 Hollis Street, Suite A
Emeryville, California
U.S.A. 94608

Office: 510-420-0700
Fax: 510-420-9170

web: <http://www.CRAworld.com>

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1.0 INTRODUCTION

On behalf of Shell Oil Products US, Conestoga-Rovers & Associates (CRA) has prepared this Bay Area Air Quality Management District (BAAQMD) *Authority to Construct/Permit to Operate Application* for installation and operation of a temporary soil vapor extraction (SVE) system at the subject site. CRA's February 28, 2013 *Petroleum Hydrocarbon Mass Removal Event Work Plan* (work plan) recommended implementing an SVE system in conjunction with groundwater extraction (GWE) and air sparging (AS) to remove the remaining hydrocarbons in the impacted soils within the vadose, smear, and saturated zones. The completed permit application forms are presented as Appendix A.

2.0 SITE BACKGROUND

2.1 SITE DESCRIPTION

This Shell-branded service station is located on the southeastern corner of First Street and Vineyard Avenue in a mixed residential and commercial area of Pleasanton, California (Figures 1 and 2). The site layout includes three current fuel underground storage tanks (USTs), a former fuel UST complex, two fuel dispenser islands, a former waste oil UST, and a station building.

A complete site history is attached as Appendix B.

3.0 DESCRIPTION OF PROPOSED DISCHARGE

3.1 PROCESS

The proposed SVE system will be used to remove the remaining hydrocarbons in the impacted soils within the vadose, smear, and saturated zones. CRA will initially conduct SVE from two to three wells (EW-1 and SVE-2 through SVE 4) while sparging into wells AS-1 and AS-10. As hydrocarbon mass removal rates from the SVE wells become negligible or significantly decline to asymptotic levels, CRA will conduct SVE from wells EW-2, MW-1, MW2, MW-4, and SVE-5 in conjunction with GWE. The system consists of aboveground remediation equipment; the major components of which are a thermal/catalytic oxidizer (TCat), a groundwater storage tank, pumps, and controls, and an air compressor for sparging. Hydrocarbon vapor concentrations will be periodically field measured from the extraction wells to assess volatilization of

hydrocarbons from groundwater and soils and overall mass removal rates. The actual length of the removal event from each well will depend on mass removal rates recovered from each well. Laboratory samples will be collected on a periodic basis to confirm and quantify hydrocarbon concentration readings collected in the field. Vapor samples will also be collected periodically from the SVE effluent to confirm required destruction efficiencies and emission rates are met.

CRA will run the system equipment approximately 10.5 hours per day to comply with local noise ordinances. Currently, the plan is to run the mass removal event for a minimum 10-day period, with a projected maximum extent of this initial mass removal event limited to four 5-day (Monday through Friday) periods. If hydrocarbon mass removal rates are sustained through the end of the 2-week period, CRA will consider additional system operation.

A site layout and a process and instrumentation diagram are included as Figures 3 and 4 respectively.

3.2 CONTAMINANT INFORMATION

Groundwater at this site has been monitored since 1999. The contaminants known to be present in the soil and/or groundwater are total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and methyl tertiary-butyl ether (MTBE).

3.3 EQUIPMENT AND OPERATION

The TCat is a trailer-mounted Solleco 500 Thermal/Catalytic Oxidizer. This unit requires supplemental fuel (propane) for operation and proper abatement of extracted soil vapors. The TCat utilizes a positive displacement blower, powered by a 30-horsepower electric motor, as an extraction device. A throttle valve and dilution valve allow adjustment of applied vacuum and corresponding flow. An electro/mechanical auto-dilution controller adjusts the dilution air to well field air flow ratio to compensate for changing influent hydrocarbon concentrations and to maintain the appropriate destruction efficiency.

The TCat will be operated in thermal mode at a minimum temperature of 1,400 degrees Fahrenheit (°F). Control devices will shut down the TCat to prevent operation outside of these temperature parameters, and an autodialer will notify CRA of any shutdowns.

Periodically, influent and effluent samples will be collected from the vapor stream in Tedlar bags and submitted for laboratory analysis to verify compliance with BAAQMD emission limits.

Emission Calculation

As discussed, emissions will be abated by the TCat (A-1). For a conservative estimate of the daily emission rates (in pounds per day [lb/day]), the DPE system will be assumed to operate with consistent influent concentrations of 3,800 parts per million by volume (ppmv) TPHg and of 1.7 ppmv benzene at the nominal system (extraction) flow rate of 500 standard cubic feet per minute (scfm). Vapor-phase hydrocarbon concentrations observed during previous pilot testing at the site and the maximum flow capacity of the TCat are used in estimating the operational parameters of the soil vapor extraction system. The pilot test data are included in Appendix C. The highest concentrations observed during the pilot test are used as representative start-up and normal operating concentrations.

Engineering Constants and Assumptions

- Standard operating conditions: pressure = 1 atmosphere; inlet temperature = 21 degrees Celsius (°C); 1 mole occupies 24.45 liters (L).
- Molecular weights: TPHg = 100 gram per mole (g/mole) (value for "weathered gasoline") and benzene = 78 g/mole.
- Destruction efficiency (based on specifications from vendor): TCat = >98%.

TPHg Vapor Emission Calculation

$$(3,800 \text{ ppmv})(500 \text{ scfm})(1,440 \text{ min/day})(28.32 \text{ L/ft}^3)(\text{mole}/24.45 \text{ L})(100 \text{ g/mole})(1/454 \text{ lbs/g})(1-0.98)(10^{-6}) =$$

13.96 lbs/day

Benzene Vapor Emission Calculation

$$(1.7 \text{ ppmv})(500 \text{ scfm})(1,440 \text{ min/day})(28.32 \text{ L/ft}^3)(\text{mole}/24.45 \text{ L})(78 \text{ g/mole})(1/454 \text{ lbs/g})(1-0.98)(10^{-6}) =$$

0.005 lbs/day

These estimates use maximum operating parameters, and are considered conservative. The highest emissions usually occur at the beginning of operations. So, these daily emission rates should decrease with time as the influent concentrations decrease. Furthermore, additional engineering controls will be performed (i.e., diluted influent concentrations or reduced extraction flow rate) to reduce benzene vapor emissions, as necessary, to meet the acceptable risk level.

Manufacturer/supplier specification sheets for extraction blower and TCat to be used are provided in Appendix D.

3.4 RISK ANALYSIS INFORMATION

Based on discussions with BAAQMD personnel, we understand that a Health Risk Screening Analysis (HRSA) is required if emissions are greater than published toxic trigger levels (TTLs) for the constituent(s). Based on the expected emission rates discussed in section 3.3, none of the chemicals listed in the BAAQMD's Table 2-5-1 should be exceeded; however, the completed HRSA form and associated figure showing locations of adjacent buildings with respect to the remediation system exhaust are included in Appendix A. A public notification is required for emission points located within 1,000 feet of a K-12 school. CRA's survey concluded that there are no schools within this range; therefore, a public notification is not required.

4.0 CLOSING

A check payable to The Bay Area Air Quality Management District will be mailed once the permit fee invoice is generated.

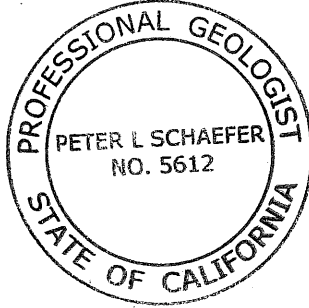
All of Which is Respectfully Submitted,
CONESTOGA-ROVERS & ASSOCIATES



Jeff Schrupp



Peter Schaefer, CEG, CHG



FIGURES

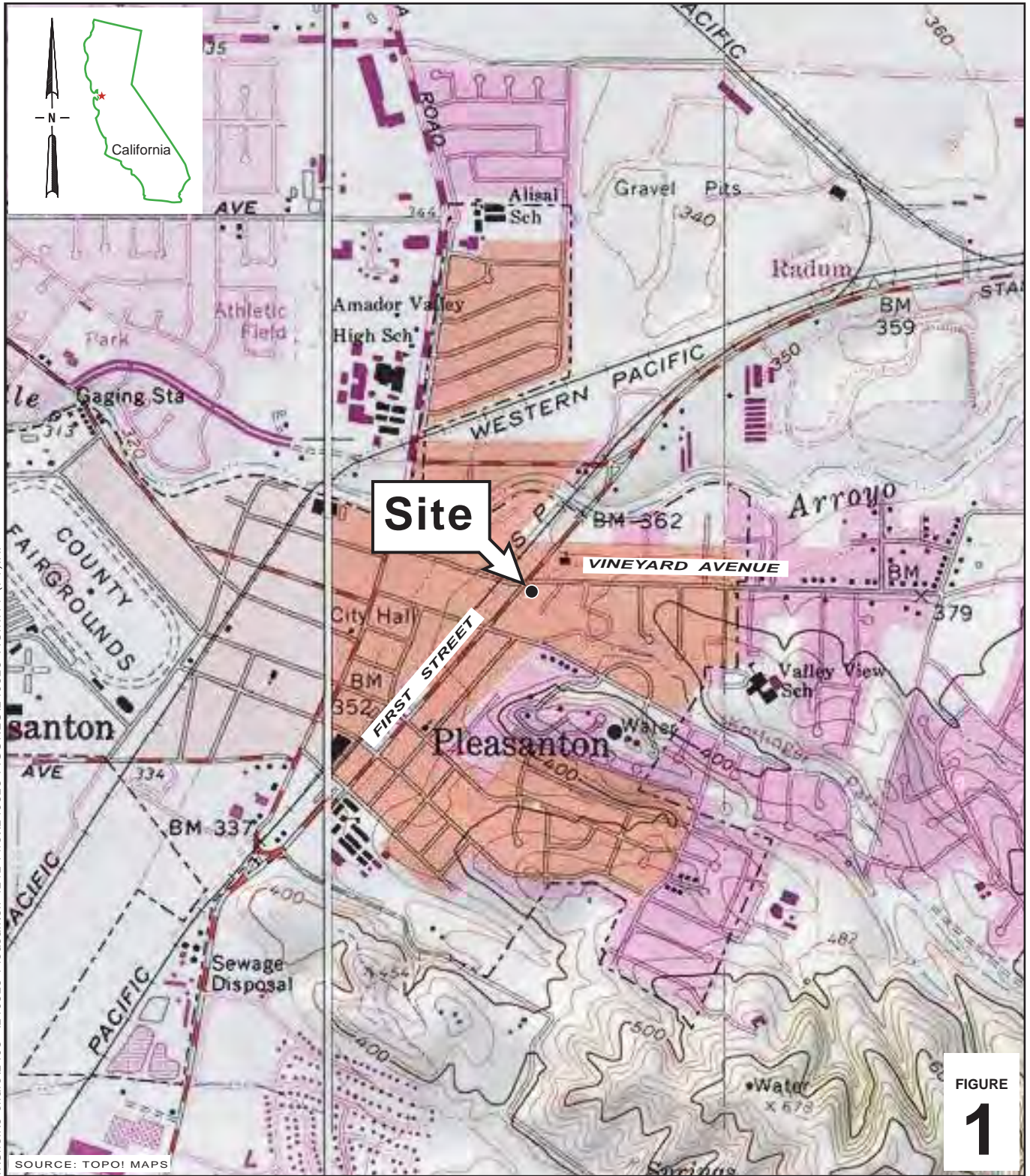


FIGURE
1

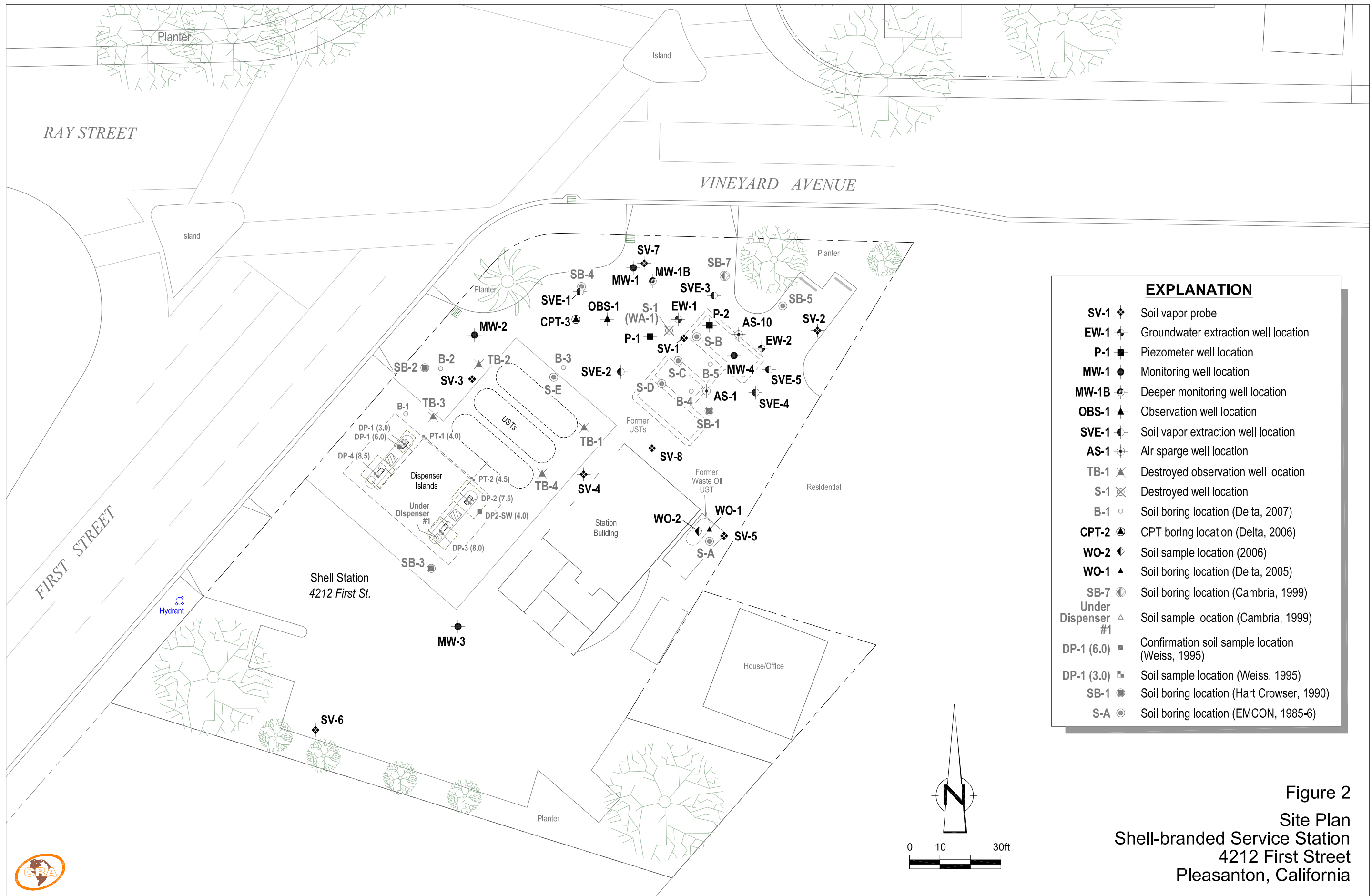
I:\Shell\6-charts\2405--\240523-Pleasanton_4212_First\240523-FIGURES\240523 VICINITY (F1).AI

Shell-branded Service Station
4212 First Street
Pleasanton, California



**CONESTOGA-ROVERS
& ASSOCIATES**

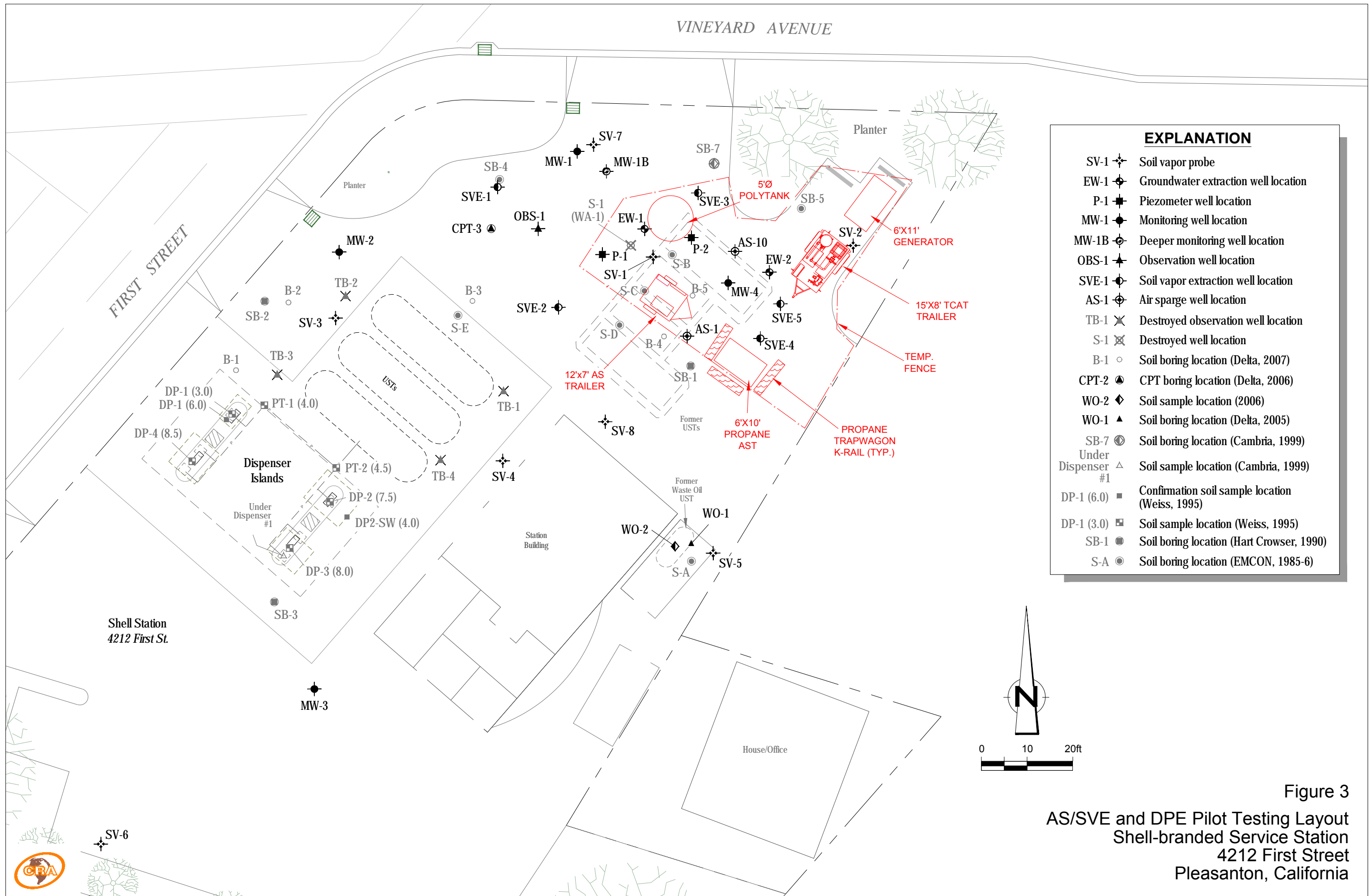
Vicinity Map

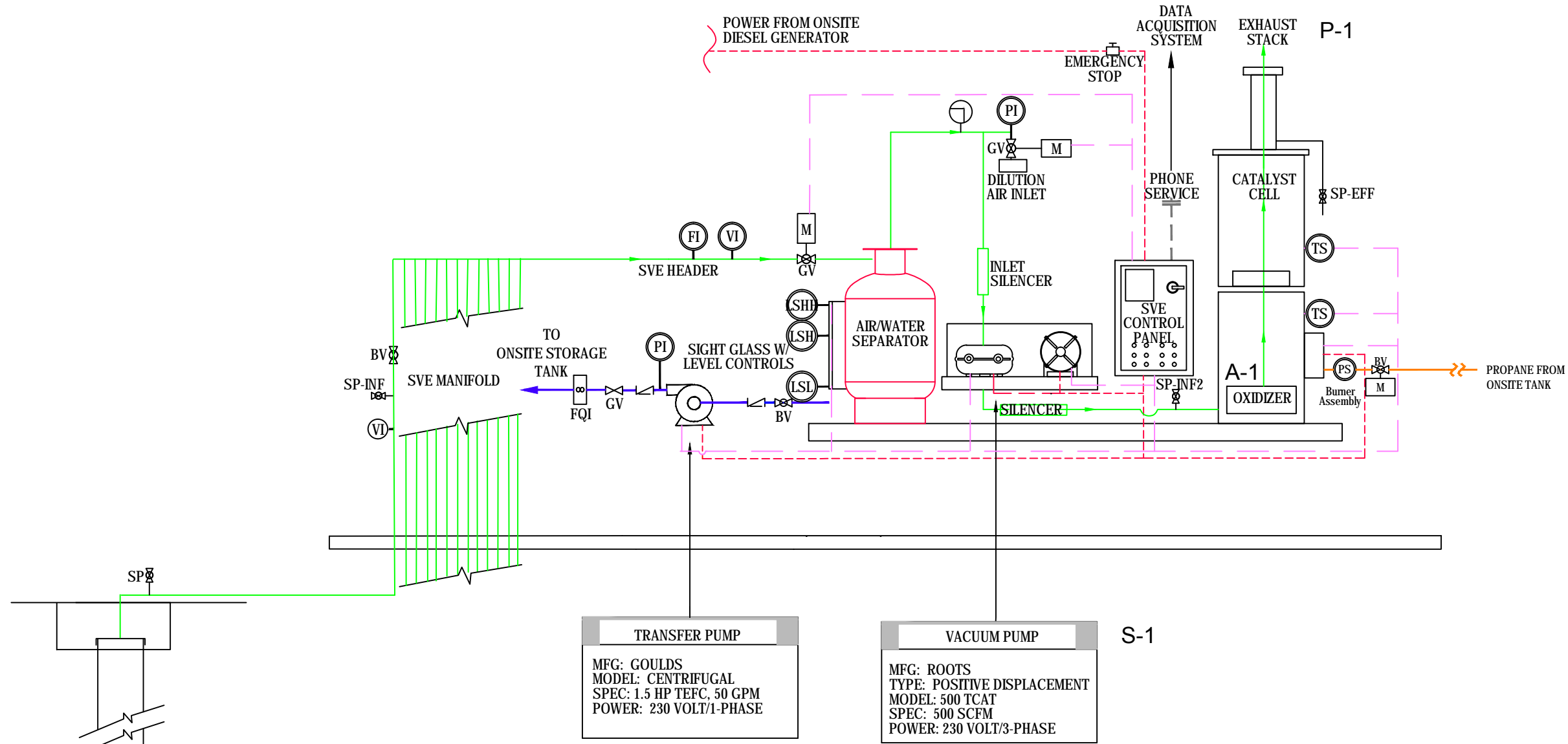


EXPLANATION	
SV-1	Soil vapor probe
EW-1	Groundwater extraction well location
P-1	Piezometer well location
MW-1	Monitoring well location
MW-1B	Deeper monitoring well location
OBS-1	Observation well location
SVE-1	Soil vapor extraction well location
AS-1	Air sparge well location
TB-1	Destroyed observation well location
S-1	Destroyed well location
B-1	Soil boring location (Delta, 2007)
CPT-2	CPT boring location (Delta, 2006)
WO-2	Soil sample location (2006)
WO-1	Soil boring location (Delta, 2005)
SB-7	Soil boring location (Cambria, 1999)
Under Dispenser #1	Soil sample location (Cambria, 1999)
DP-1 (6.0)	Confirmation soil sample location (Weiss, 1995)
DP-1 (3.0)	Soil sample location (Weiss, 1995)
SB-1	Soil boring location (Hart Crowser, 1990)
S-A	Soil boring location (EMCON, 1985-6)

Figure 2
 Site Plan
 Shell-branded Service Station
 4212 First Street
 Pleasanton, California







TRANSFER PUMP
 MFG: GOULDS
 MODEL: CENTRIFUGAL
 SPEC: 1.5 HP TEFC, 50 GPM
 POWER: 230 VOLT/1-PHASE

VACUUM PUMP
 MFG: ROOTS
 TYPE: POSITIVE DISPLACEMENT
 MODEL: 500 TCAT
 SPEC: 500 SCFM
 POWER: 230 VOLT/3-PHASE

EXTRACTION WELL
 (TYP. OF 9)

EXPLANATION			
	FLOWMETER/INDICATOR		LEVEL SWITCH - HI HI
	BV = BALL VALVE		LEVEL SWITCH - HI
	GV = GATE VALVE		LEVEL SWITCH - LOW
	SAMPLE PORT		PRESSURE TRANSMITTING SWITCH
	VACUUM INDICATOR		FLOW INDICATOR
	WATER TRAP		TEMPERATURE SENSOR
	AIR FILTER		VACUUM INDICATOR
	CHECK VALVE		PRESSURE INDICATOR
			VACUUM/PRESSURE RELIEF VALVE
			MOTOR
			EMERGENCY STOP BUTTON
			SVE PIPING
			ELECTRICAL CONTROL WIRING
			ELECTRICAL POWER WIRING
			GROUNDWATER PIPING

CLIENT
SHELL OIL PRODUCTS US
PROJECT
SHELL-BRANDED SERVICE STATION 4212 FIRST STREET PLEASANTON, CALIFORNIA PROJECT # 240523
TITLE
SOIL VAPOR EXTRACTION SYSTEM P&ID

DRAWING STATUS			
Nº	Revision	Date	Initial

SCALE VERIFICATION
 THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

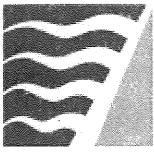


CONESTOGA-ROVERS & ASSOCIATES
 5900 HOLLIS STREET, SUITE A
 EMERYVILLE, CA 94608
 PHONE: 510.420.0700
 FAX: 510.420.9170
 WWW.CRAWORLD.COM

Source Reference:		
Designed By: JS	Date: 2/22/13	Drawing Nº: 4
Drafted By: JS	Date: 2/22/13	
Reviewed By: LB	Date: 2/22/13	
Scale: NOT TO SCALE		

APPENDIX A

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
APPLICATION FORMS



BAY AREA AIR QUALITY MANAGEMENT DISTRICT

939 Ellis Street . . . San Francisco, CA 94109 . . . (415) 749-4990 . . . FAX (415) 749-5030

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for office use only

Abatement Device: Equipment/process whose primary purpose is to reduce the quantity of pollutant(s) emitted to the atmosphere.

1. Business Name: Shell Oil Products US Plant No: _____
(If unknown, leave blank)

2. Name or Description Thermal/Catalytic Oxidizer Abatement Device No: A-1

3. Make, Model, and Rated Capacity Solleco 500 TCAT

4. Abatement Device Code (See table*) 2 & 3 Date of Initial Operation _____

5. With regard to air pollutant flow into this abatement device, what sources(s) and/or abatement device(s) are **immediately** upstream?

S- 1 S- _____ S- _____ S- _____ S- _____
S- _____ A- _____ A- _____ A- _____ A- _____ A- _____

6. Typical gas stream temperature at inlet: 68 °F

If this form is being submitted as part of an application for an **Authority to Construct**, completion of the following table is mandatory. If not, and the Abatement Device is *already in operation*, completion of the table is requested but not required.

	Weight Percent Reduction (at typical operation)	Basis Codes (See Table**)
7. Particulate		
8. Organics		
9. Nitrogen Oxides (as NO ₂)		
10. Sulfur Dioxide		
11. Carbon Monoxide		
12. Other: Benzene (41)	>98	1, 3
13. Other: Volatile Organic Carbons	>98	1, 3

14. Check box if this Abatement Device burns fuel; complete lines 1, 2 and 15-36 on Form C (using the Abatement Device No. above for the Source No.) and attach to this form.

15. With regard to air pollutant flow from this abatement device, what sources(s), abatement device(s) and/or emission point(s) are **immediately** downstream?

S- _____ A- _____ A- _____ A- _____ P- 1 P- _____

Person completing this form: <u>Vanessa Marin</u>	Date: <u>02/19/2013</u>
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***ABATEMENT DEVICE CODES**

Code	DEVICE
	ADSORBER (See Vapor Recovery)
	AFTERBURNER
1	CO Boiler
2	Catalytic
3	Direct Flame
4	Flare
5	Furnace-firebox
6	Other
	BAGHOUSE (See Dry Filter)
	CYCLONE (See Dry Inertial Collector and Scrubber)
	DUST CONTROL
68	Water Spray
	DRY FILTER
7	Absolute
8	Baghouse, Pulse Jet
9	Baghouse, Reverse Air
10	Baghouse, Reverse Jet
11	Baghouse, Shaking
12	Baghouse, Simple
13	Baghouse, Other
14	Envelope
15	Moving Belt
16	Other
	DRY INERTIAL COLLECTOR
17	Cyclone, Dynamic
18	Cyclone, Multiple (12 inches dia. or more)
19	Cyclone, Multiple (less than 12 inches dia.)
20	Cyclone, Simple
21	Settling Chamber, Baffled/Louvered
22	Settling Chamber, Simple
23	Other
	ELECTROSTATIC PRECIPITATOR
24	Single Stage
25	Single Stage, Wet
26	Two Stage
27	Two Stage, Wet
28	Other
	INCINERATOR (See Afterburner)
	INTERNAL COMBUSTION ENGINE CONTROL
69	Catalyzed Diesel Particulate Filter
70	Non-Cat. Diesel Part. Filter w/ Active Regeneration
71	Diesel Oxidation Catalyst
72	Oxidation Catalyst
	KNOCK-OUT POT (See Liquid Separator)
	LIQUID SEPARATOR
29	Knock-out Pot
30	Mist Eliminator, Horizontal Pad, Dry
31	Mist Eliminator, Panel, Dry
32	Mist Eliminator, Spray/Irrigated
33	Mist Eliminator, Vertical Tube, Dry
34	Mist Eliminator, Other
35	Other
	NO _x CONTROL
66	Selective Catalytic Reduction (SCR)

Code	DEVICE
67	Non-Selective Catalytic Reduction (NSCR)
73	Selective Non-Catalytic Reduction (SNCR)
	SCRUBBER
36	Baffle and Secondary Flow
37	Centrifugal
38	Cyclone, Irrigated
39	Fibrous Packed
40	Impingement Plate
41	Impingement and Entrainment
42	Mechanically Aided
43	Moving Bed
44	Packed Bed
45	Preformed Spray
46	Venturi
47	Other
	SETTLING CHAMBER (See Dry Inertial Collector)
	SULFUR DIOXIDE CONTROL
48	Absorption and Regeneration, for Sulfur Plant
49	Claus Solution Reaction, for Sulfur Plant
50	Dual Absorption, for H ₂ S ₀₄ Plant
51	Flue Gas Desulfurization, for Fossil Fuel Combustion
52	Reduction and Solution Regeneration, for Sulfur Plant
53	Reduction and Stretford Process, for Sulfur Plant
54	Sodium Sulfite-Bisulfite Scrubber, for H ₂ S ₀₄ Plant
55	Other
	VAPOR RECOVERY
56	Adsorption, Activated Carbon/Charcoal
57	Adsorption, Silica
58	Adsorption, Other
59	Balance
60	Compression/Condensation/Absorption
61	Compression/Refrigeration
62	Condenser, Water-Cooled
63	Condenser, Other
64	Other
	MISCELLANEOUS
74	Soil Vapor Extraction Abatement System
65	Not classified above

****BASIS CODES**

Code	Method
0	Not applicable for this pollutant
1	Source testing or other measurement by plant
2	Source testing or other measurement by BAAQMD
3	Specifications from vendor
4	Material balance by plant using engineering expertise and knowledge of process
5	Material balance by BAAQMD using engineering expertise and knowledge of process
6	Taken from AP-42 ("Compilation of Air Pollutant Emission Factors," EPA)
7	Taken from literature, other than AP-42
8	Guess

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

939 Ellis Street . . . San Francisco, CA 94109 . . . (415) 749-4990 . . . fax (415) 749-5030

Website: www.baaqmd.gov

**Data Form C
FUEL COMBUSTION SOURCE**

(for District use only)

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New Modified Retro

Form C is for all operations which burn fuel except for internal combustion engines (use Form ICE unless it is a gas turbine; for gas turbines use this form). If the operation also involves evaporation of any organic solvent, complete Form S and attach to this form. If the operation involves a process which generates any other air pollutants, complete Form G and attach to this form.

Check box if this source has a secondary function as an abatement device for some other source(s); complete lines 1, 2, and 7-13 on Form A (using the source number below for the Abatement Device No.) and attach to this form.

(If unknown, leave blank)	
1. Company Name: Shell Oil Products US	Plant No: _____ Source No. S-1
2. Equipment Name & Number, or Description: Soil Vapor Extraction-Thermal/Catalytic Oxidizer	
3. Make, Model: Solleco, 500 cfm, Thermal/Catalytic Oxidizer	Maximum firing rate: 1x10^6 Btu/hr
4. Date of modification or initial operation: _____ (if unknown, leave blank)	
5. Primary use (check one):	
<input type="checkbox"/> electrical generation <input type="checkbox"/> space heat <input type="checkbox"/> waste disposal <input type="checkbox"/> testing <input checked="" type="checkbox"/> abatement device <input type="checkbox"/> cogeneration <input type="checkbox"/> resource recovery <input type="checkbox"/> other <input type="checkbox"/> process heat; material heated _____	
6. SIC Number _____ <small>If unknown leave blank</small>	
7. Equipment type (check one)	
Internal combustion Use Form ICE (Internal Combustion Engine) unless it is a gas turbine	
<input type="checkbox"/> gas turbine _____ hp <input type="checkbox"/> other _____ hp	
Incinerator	
<input type="checkbox"/> salvage operation <input type="checkbox"/> pathological waste Temperature _____ °F <input type="checkbox"/> liquid waste <input type="checkbox"/> other _____ Residence time _____ Sec	
Others	
<input type="checkbox"/> boiler <input type="checkbox"/> dryer <input type="checkbox"/> afterburner <input type="checkbox"/> oven <input type="checkbox"/> flare <input type="checkbox"/> furnace Material dried, baked, or heated: _____ <input type="checkbox"/> open burning <input type="checkbox"/> kiln <input checked="" type="checkbox"/> other Oxidizer	
8. Overfire air? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no If yes, what percent _____ %	
9. Flue gas recirculation? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no If yes, what percent _____ %	
10. Air preheat? <input checked="" type="checkbox"/> yes <input type="checkbox"/> no Temperature 600 °F	
11. Low NO _x burners? <input type="checkbox"/> yes <input checked="" type="checkbox"/> no Make, Model Solleco 500 TCAT	
12. Maximum flame temperature 1,200 °F	
13. Combustion products: Wet gas flowrate 1,600 acfm at 1,200 °F Typical Oxygen Content <20 dry volume % or _____ wet volume % or _____ % excess air	
14. Typical Use 11 hours/day 5 days/week 4 weeks/year	
15. Typical % of annual total: Dec-Feb 0% Mar-May 100% Jun-Aug 0% Sep-Nov 0%	
16. With regard to air pollutant flow, what source(s) or abatement device(s) are immediately UPSTREAM?	
S 1 S S S S S A A A	
With regard to air pollutant flow, what source(s) or abatement device(s), and/or emission points are immediately DOWNSTREAM?	
S S A 1 A P P	

Person completing this form: Vanessa Marin	Date: 2/19/2013
--	-----------------

(revised 5/11)

FUELS

INSTRUCTIONS: Complete one line in Section A for each fuel. Section B is OPTIONAL. Please use the units at the bottom of each table. N/A means "Not Applicable."

SECTION A: FUEL DATA

	Fuel Name	Fuel Code**	Total Annual Usage***	Maximum Possible Fuel Use Rate	Typical Heat Content	Sulfur Content	Nitrogen Content (optional)	Ash Content (optional)
1.	Natural Gas		210,000	1x10^6	N/A	N/A	N/A	N/A
2.								
3.								
4.								
5.								

<i>Use the appropriate units for each fuel</i>	Natural Gas	therm*	Btu/hr	N/A	N/A	N/A	N/A
	Other Gas	MSCF*	MSCF/hr	Btu/MSCF	ppm	N/A	N/A
	Liquid	m gal*	m gal/hr	Btu/m gal	wt%	wt%	wt%
	Solid	ton	ton/hr	Btu/ton	wt%	wt%	wt%

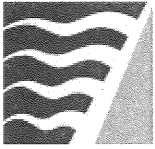
SECTION B: EMISSION FACTORS (optional)

	Fuel Name	Fuel Code**	Particulates		NOx		CO	
			Emission Factor	**Basis Code	Emission Factor	**Basis Code	Emission Factor	**Basis Code
1.								
2.								
3.								
4.								

Use the appropriate units for each fuel: Natural Gas = lb/therm*
 Other Gas = lb/MSCF*
 Liquid = lb/m gal*
 Solid = lb/ton

- Note:**
- * MSCF = thousand standard cubic feet
 - * m gal = thousand gallons
 - * therm = 100,000 BTU
 - ** See tables below for Fuel and Basis Codes
 - *** Total annual usage is: - Projected usage over next 12 months if equipment is new or modified.
 - Actual usage for last 12 months if equipment is existing and unchanged.

**Fuel Codes				**Basis Codes	
Code	Fuel	Code	Fuel	Code	Method
25	Anthracite coal	189	Natural Gas	0	Not applicable for this pollutant
33	Bagasse	234	Process gas - blast furnace	1	Source testing or other measurement by plant (attach copy)
35	Bark	235	Process gas - CO	2	Source testing or other measurement by BAAQMD (give date)
43	Bituminous coal	236	Process gas - coke oven gas	3	Specifications from vendor (attach copy)
47	Brown coal	238	Process gas - RMG	4	Material balance by plant using engineering expertise and knowledge of process
242	Bunker C fuel oil	237	Process gas - other	5	Material balance by BAAQMD
80	Coke	242	Residual oil	6	Taken from AP-42 (compilation of Air Pollutant Emission Factors, EPA)
89	Crude oil	495	Refuse derived fuel	7	Taken from literature, other than AP-42 (attach copy)
98	Diesel oil	511	Landfill gas	8	Guess
493	Digester gas	256	Solid propellant		
315	Distillate oil	466	Solid waste		
392	Fuel oil #2	304	Wood - hogged		
551	Gasoline	305	Wood - other		
158	Jet fuel	198	Other - gaseous fuels		
160	LPG	200	Other - liquid fuels		
165	Lignite	203	Other - solid fuels		
167	Liquid waste				
494	Municipal solid waste				



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Form G is for general air pollution sources. Use specific forms when applicable. If this source burns fuel, then also complete Form C.

1. Business Name: Shell Oil Products US Plant No: _____ (if unknown, leave blank)
2. SIC No.: _____ Date of Initial Operation April 2013 [est.]
3. Name or Description: Soil vapor extraction: Thermal/Catalytic Oxidizer Source No.: S-1
4. Make, Model, and Rated Capacity of Equipment: Roots URAI 59 blower, 500 scfm at 14 "Hg
5. Process Code¹ 7156 Material Code² 338 Usage Unit² Million cubic feet
6. Total throughput, last 12 mos. NA usage units² Maximum operating rate: 0.03 usage units² /hr
7. Typical % of total throughput: Dec-Feb 0 % Mar-May 100 % Jun-Aug 0 % Sep-Nov 0 %
8. Typical operating times: 10.5 hrs/day 5 days/week 4 Weeks/year
9. For batch or cyclic processes: NA minutes/cycle NA minutes between cycles
10. Exhaust gases from source: Wet gas flowrate 500 cfm at 68 °F
(at maximum operation) Approximate water vapor content 1.8 volume%

EMISSION FACTORS (at maximum operating rate)

If this form is being submitted as part of an application for an **authority to construct**, completion of the following table is mandatory. If not, and the Source is *already in operation*, completion of the table is requested but not required.

If this source also burns fuel, do not include those combustion products in the emission factors below; they are accounted for on Form C. If source test or other data are available for composite emissions only, estimate from those data the emissions attributable to just the general process and show below.

Check box if factors apply to emissions **after** Abatement Device(s).

	<i>Emission Factors lb/Usage Unit²</i>	<i>Basis Code³</i>
11. Particulate.....		
12. Organics		
13. Nitrogen Oxides (as NO ₂).....		
14. Sulfur Dioxide		
15. Carbon Monoxide		
16. Other: Volatile Organic Carbons	19.4	1, 3

17. With regard to air pollutant flow from this source, what source(s), abatement device(s) and/or emission point(s) are **immediately** downstream?

S- _____ S- _____ S- _____ A- 1 A- _____ A- _____
 A- _____ P- 1 P- _____ P- _____ P- _____

¹See Tables G-1 through G-7 for code
³See Basis Code Table below

²See Table G5 or the Material Codes Table (available upon request)

Person completing this form: <u>Vanessa Marin</u>	Date: <u>2/19/2013</u>
---	------------------------

Basis Code	
Codes	Method
0	Not applicable for this pollutant
1	Source Testing or other measurement <i>by plant</i>
2	Source Testing or other measurement <i>by BAAQMD</i>
3	Specification from vendor
4	Material balance <i>by plant</i> using engineering expertise and knowledge of process
5	Material balances <i>by BAAQMD</i> using engineering expertise and knowledge of process
6	Taken from AP-42 ("Compilation of Air Pollutant Emission Factors," E.P.A.)
7	Taken from literature, other than AP-42
8	Guess

Process Code Tables for General Air Pollution Sources (Data Form G)	
Table	Process
G-1	Food & Agricultural
G-3	Metallurgical (Secondary Metals)
G-4	Mineral
G-5	Petroleum Refining
G-7	Chemical/Other
G-8	Miscellaneous
G-9	Fugitive Emissions

**TABLE G-1
FOOD AND AGRICULTURAL PROCESSES**

<u>CODE</u>	<u>PROCESS</u>
1028	Aging
1001	Brewing
1022	Cleaning
1021	Conveying/transferring
1003	Cooking
1020	Cooling/stoning
1004	Cotton ginning - cleaner
1005	Cotton ginning - stick/burr machine
1006	Cotton ginning - unloading fan
1026	Dehydration
1007	Direct fired kiln
1008	Direct fired roaster
1016	Dryer - rotary
1019	Dryer - spray
1023	Dryer - other
1009	Drying tower
1030	Extraction - mechanical
1029	Extraction - solvent
1027	Fermentation
1014	Grinding
1010	Indirect fired kiln
1011	Indirect fired roaster
1007	Kiln - direct fired
1010	Kiln - indirect fired
1012	Liquor aging
1013	Meat smoker
1024	Milling
1036	Mixing/blending
1025	Oven baking
1035	Packaging
1030	Pressing - extraction
1031	Pressing - other
1015	Prilling
1008	Roaster - direct fired
1011	Roaster - indirect fired
1016	Rotary dryer
1017	Screening
1018	Shipping & receiving
1019	Spray dryer
1032	Sterilization - food/pharmaceutical products
1020	Stoning/cooling
1034	Storage
1033	Sulfuring - fruit/food stuff
1021	Transferring/conveying
1999	Other/not specified

TABLE G-3

METALLURGICAL (SECONDARY METALS)

DRYING (Kilns/Dryers/Ovens)

3002 Calcining kiln
 3003 Concentrate dryer
 3004 Oxide kiln
 3005 Other/not specified

FURNACES

3030 Bake furnace
 3007 Blast furnace
 3008 Casting furnace
 3009 Crucible furnace
 3010 Cupola
 3011 Cupola furnace
 3012 Electric arc furnace
 3013 Flux furnace
 3014 Heat treating furnace
 3015 Horizontal muffle furnace
 3016 Induction furnace
 3017 Open hearth furnace
 3018 Open hearth furnace w/ oxygen lance
 3019 Pot furnace
 3020 Retort furnace
 3059 Reverberatory - rotary
 3022 Reverberatory - sweat
 3021 Reverberatory - other
 3023 Rotary furnace - non-reverberatory
 3024 Smelt-crucible furnace
 3025 Smelt-reverberatory furnace
 3026 Sweating furnace
 3027 Other/not specified

MATERIAL HANDLING/MISCELLANEOUS

3062 Abrasives blasting
 3078 Alodyning
 3029 Annealing
 3065 Annealing - continuous
 3063 Anodizing
 3069 Buffing/polishing
 3031 Can making operations
 3046 Casting - miscellaneous
 3033 Chlorination station
 3062 Cleaning - abrasives blasting
 3034 Cleaning - chemical
 3076 Conveying
 3068 Crushing/shredding
 3035 Drawing
 3036 Drilling
 3037 Extruding

3047 Fabricating - miscellaneous
 3039 Finishing - soak pit
 3038 Finishing - other/not specified
 3040 Foil converting
 3041 Foil rolling
 3042 Galvanizing
 3043 Grinding
 3044 Honing
 3045 Lead oxide manufacturing
 3067 Machine shop operations
 3061 Milling/turning
 3046 Miscellaneous casting
 3047 Miscellaneous fabricating
 3048 Mixing
 3064 Non-destructive coating
 3049 Paste mixer (lead batteries)
 3072 Pickling
 3050 Pitch treating (furnace electrode mfg)
 3051 Plating (not chrome)
 3070 Plating dec chrome-hexavalent <=500,000
 amphr
 3080 Plating dec chrome-hexavalent >500,000
 amphr
 3079 Plating dec chrome-trivalent
 3071 Plating hard chrome-hexavalent
 3081 Plasma metal application (thermal spraying)
 3052 Reaming
 3073 Refining
 3053 Rolling
 3054 Sand handling
 3055 Sanding
 3056 Sawing
 3077 Screening
 3060 Sintering
 3075 Soldering
 3057 Storage
 3074 Ventilation
 3066 Welding
 3999 Other/not specified

TABLE G-4

MINERAL PROCESSES

DRYING (Kilns/Dryers/Ovens)

4002 Calcimatic kiln
 4082 Cement calcining kiln
 4003 Coke dryer
 4004 Curing oven
 4005 Fluidized bed kiln
 4006 Rotary dryer
 4070 Rotary kiln
 4007 Vertical kiln
 4008 Other/not specified

FURNACES

4010 Cupola
 4012 Electric furnace
 4011 Electric induction furnace
 4013 Reverberatory furnace - other
 4014 Reverberatory furnace - recupex
 4015 Reverberatory furnace - regenex
 4071 Rotary - non-reverberatory
 4016 Soda lime genl furnace (glass manufacturing)
 4072 Vertical furnace - other
 4017 Other/not specified

MATERIAL HANDLING/MISCELLANEOUS

4073 Abrasives blasting
 4019 Asphalt blowing
 4020 Asphalt dipping
 4077 Asphalt mixing - batch/continuous
 4078 Asphalt mixing - rotary drum
 4021 Asphalt spraying
 4022 Bagging
 4073 Blasting - abrasives cleaning
 4023 Blasting - quarry
 4024 Blow chamber
 4075 Calcining
 4025 Coal cleaning - therm/flash
 4026 Coal cleaning - therm/fluid bed
 4027 Coal cleaning - therm/multi low pd
 4028 Concrete batching - asbestos/cement products
 4029 Concrete batching - other
 4030 Conveying
 4031 Cooling
 4032 Crushing
 4033 Drying (open air)
 4034 Electric arc melting
 4035 Fiberizing

4036 Forming line (fiberglass manufacturing)
 4037 Furnace room venting
 4074 Glass enamel spraying
 4038 Glass manufacturing - batching
 4039 Glass manufacturing - material receiving
 4040 Glass manufacturing - material storage
 4041 Glass manufacturing - mixing
 4042 Glass manufacturing - molten holding tanks
 4043 Glass manufacturing - other/not specified
 4044 Grinding
 4045 Hold/shakeout
 4046 Hydrator
 4079 Loading - feed/surge/weigh bins
 4080 Loading/unloading (non-mining/quarry)
 4047 Milling
 4048 Mining/quarry - cobbing
 4053 Mining/quarry - crushing (primary)
 4054 Mining/quarry - crushing (secondary)
 4069 Mining/quarry - crushing (tertiary)
 4061 Mining/quarry - loading/unloading
 4049 Mining/quarry - open pit blasting
 4050 Mining/quarry - open pit cobbing
 4051 Mining/quarry - open pit drilling
 4052 Mining/quarry - ore concentrating
 4055 Mining/quarry - stockpiling
 4056 Mining/quarry - stripping
 4057 Mining/quarry - surface blasting
 4058 Mining/quarry - surface drilling
 4059 Mining/quarry - tailing piles
 4060 Mining/quarry - tailings
 4062 Mining/quarry - ventilating
 4068 Mining/quarry - other
 4081 Mixing operations
 4063 Road surfacing
 4073 Sand blasting
 4064 Screening
 4065 Sintering
 4066 Stone cutting
 4067 Storage - contained
 4076 Storage - open
 4037 Venting - furnace room
 4099 Other/not specified

TABLE G-5

PETROLEUM REFINING PROCESSES

<u>CODE</u>	<u>PROCESS</u>	<u>CODE</u>	<u>MATERIAL</u>	<u>USAGE UNITS</u>
5040	Air Stripping/DAF processing	300	Waste Water	1000 barrels
5030	Alkylation	195	Hydrocarbons - olefinic	1000 barrels feed
5001	Asphalt oxidizer	30	Asphalt	tons processed
5002	Blow-down system - w/ controls	340	Crude oil *	1000 bbl/day ref cap
5003	Blow-down system - w/o controls	340	Crude oil *	1000 bbl/day ref cap
5004	Catalytic reforming	342	Cat reformer fresh feed	1000 barrels fresh feed
5023	Chemical treating - other	239	Feedstock	1000 barrels
5038	Coke storage piles (open)	80	Coke	tons
5025	Converting - other/not specified	239	Feedstock	1000 barrels
5005	Cooling tower	428	Water - brackish/sea	1000 gallons
5005	Cooling tower	415	Water - fresh	1000 gallons
5005	Cooling tower	300	Waste Water	1000 barrels
5018	Delayed coking	343	Delayed coke product	tons produced
5027	Distillation - crude	89	Crude oil	1000 barrels
5032	Distillation - vacuum	339	Vacuum distillation feed	1000 barrels
5028	Distillation - other	239	Feedstock	1000 barrels
5034	Flexicoking	346	Coker fresh feed	1000 barrels fresh feed
5007	Fluid cat cracker	344	FCC fresh feed	1000 barrels fresh feed
5008	Fluid coking - cooling	345	Fluid coke product	tons produced
5009	Fluid coking - general	346	Coker fresh feed	1000 barrels fresh feed
5010	Fluid coking - storage	345	Fluid coke product	tons produced
5011	Fluid coking - transportation	345	Fluid coke product	tons produced
5021	Hydrocracking	239	Feedstock	1000 barrels
5026	Hydrogen manufacturing	50	C1-C2 paraffins	million cubic feet
5026	Hydrogen manufacturing	52	C3+ paraffins	1000 barrels feed
5026	Hydrogen manufacturing	188	Naphtha	1000 barrels feed
5022	Hydrotreating/hydrofining	239	Feedstock	1000 barrels
5031	Isomerization	52	C3+ paraffins	1000 barrels feed
5039	Marine loading/unloading berths	80	Coke	tons
5017	Oil-water separator	300	Waste water	1000 barrels
5017	Oil-water separator	427	Process water	1000 gallons
5024	Polymerization	195	Hydrocarbons - olefinic	1000 barrels feed
5012	Process drain - w/controls	442	Waste water - sour	1000 barrels
5012	Process drain - w/controls	300	Waste water	1000 barrels
5013	Process drain - w/o controls	442	Waste water - sour	1000 barrels
5013	Process drain - w/o controls	300	Waste water	1000 barrels
5017	Separator - oil/water	300	Waste water	1000 barrels
5017	Separator - oil/water	427	Process water	1000 gallons
5014	Sludge converter	347	Sludge	tons produced
5029	Solvent extraction	***	(use specific Materials Code)	
5037	Sour water stripping	442	Waste water - sour	1000 barrels
5035	Sulfur removal - other/caustic	238	Refinery fuel gas	million cubic feet
5019	Thermal cracking	446	Thermal cracker fresh feed	1000 barrels feed
5020	Thermal processing - other	446	Thermal cracker fresh feed	1000 barrels feed
5032	Vacuum distillation	339	Vacuum distillation feed	1000 barrels
5015	Vacuum jet - w/ controls	339	Vacuum distillation feed	1000 barrels
5016	Vacuum jet - w/o controls	339	Vacuum distillation feed	1000 barrels
5033	Wastewater storage - ponds	300	Waste water	1000 gallons
5036	Wastewater storage - tanks	300	Waste water	1000 gallons
5993	Other/not specified	80	Coke	tons
5994	Other/not specified	89	Crude oil	1000 barrels
5995	Other/not specified	239	Feedstock	1000 barrels feed
5997	Other/not specified	339	Vacuum distillation feed	1000 barrels
5998	Other/not specified	338	Waste gases	million cubic feet
5999	Other/not specified	321	Other petroleum products	1000 gallons

NOTE: Each process listed in Table G-5 has a specific material associated with it for use on the G-Form.
 *Code 340 for crude oil for these processes must be used; emissions are dependent on total refinery capacity rather than on throughput. Use code 89 for crude oil in any other process.

TABLE G-7

CHEMICAL PROCESSES

7019	Air blow ml brine	7065	Phosphoric acid manufacturing - thermal
7020	Ammoniating	7066	Phosphoric acid manufacturing - wet process
7016	Ammonium sulfate mfg - NH ₃ /H ₂ SO ₄ proc	7147	Phosphoric acid manufacturing - other
7018	Ammonium sulfate mfg - coke oven byprdcts	7154	Photographic equipment
7131	Biological oxidation	7067	Pressure treating - other
7021	Bodying oil	7068	Prilling
7022	Boiling tub	7153	Process tank
7023	Brine evaporation	7071	Pulpboard manufacturing
7096	Calcining - rotary kiln	7072	Pyrolysis
7024	Calcining - other	7073	Reactor - other/not specified
7030	Carbon black manufacturing - other process	7074	Regenerator
7132	Carbon dioxide liquifaction plant	7075	Rubberized fabric mfg - hot melt coating
7031	Carpet operation	7076	Rubberized fabric mfg - impregnation
7032	Caulking	7077	Rubberized fabric mfg - wet coating
7998	Chemical reaction - other/not specified	7078	Rubberized fabric mfg - other/not spec
7173	Chemical reactor - greater than 1000 gallons	7080	Scrubber
7073	Chemical reactor - other/not specified	7081	Seelite exhaust
7055	Claus - modified 2 stage	7160	Separating - DAF processing
7056	Claus - modified 3 stage	7103	Separating - oil/water
7057	Claus - modified 4 stage	7098	Separating - other
7033	Condensing	7290	Sewage - Digesters
7155	Contaminated ground water stripping	7270	Sewage - Disinfection
7156	Contaminated soil remediation	7230	Sewage - Flow equalization
7034	Cooking	7210	Sewage - Preliminary treatment
7035	Creosote pressure treating	7220	Sewage - Primary treatment
7114	Crystallizing	7300	Sewage - Reclamation
7036	Cyclohex - general	7250	Sewage - Secondary clarifiers
7151	Dipping/cleaning tank	7240	Sewage - Secondary treatment
7037	Distillation	7280	Sewage - Sludge handling processes
7133	Etching	7260	Sewage - Tertiary treatment
7038	Ethylene dichloride mfg - direct chlorination	7200	Sewage - Wastewater treatment plant
7039	Ethylene dichloride mfg - oxychlorination	7058	Sodium carbonate Solvay - NH ₃ recovery
7023	Evaporation - brine	7059	Sodium carbonate Solvay - handling
7110	Evaporation - other	7060	Sodium carbonate Trona - calcining
7040	Fabrics manufacturing - bleaching	7061	Sodium carbonate Trona - dryer
7041	Fabrics manufacturing - yarn prep	7146	Sterilization - medical equipment
7042	Fabrics manufacturing - other/not specified	7089	Sulfate pulping - other/not specified
7152	Feed/holding tank	7082	Sulfate pulping - blow tank accumulator
7158	Gas collection system	7083	Sulfate pulping - fluidbed calciner
7044	Gas purging	7084	Sulfate pulping - liquor oxidation tower
7046	Gypsum pond	7085	Sulfate pulping - mult-effect evaporation
7130	Hydrochloric acid manufacturing	7086	Sulfate pulping - smelt dissolv tank
7148	Hydrochloric acid regeneration	7087	Sulfate pulping - turpentine condenser
7043	Injection - NO _x control system	7088	Sulfate pulping - washer/screen
7144	Laboratory	7090	Sulfite pulping - digester
7145	Landfill with gas collection system	7091	Sulfite pulping - evaporator
7159	Landfill without gas collection system	7092	Sulfite pulping - liquor recovery
7132	Liquifaction - CO ₂ plant	7093	Sulfite pulping - pulp digester
7053	Liquifaction - diaphragm	7094	Sulfite pulping - smelt tank
7054	Liquifaction - merc cell	7095	Sulfite pulping - other/not specified
7055	Mod-Claus 2 stage	7047	Sulfuric acid mfg - chamber process
7056	Mod-Claus 3 stage	7048	Sulfuric acid mfg - contact process
7057	Mod-Claus 4 stage	7050	Sulfuric acid mfg - other/not specified
7097	Neutralizing	7049	Sulfuric acid regenerators
7062	Nitration reactors	7157	Tank/drum/container cleaning
7051	Nitric acid - paraxylen gen	7073	Other chemical - reactor
7052	Nitric acid concentrators	7998	Other chemical reaction - other/not spec
7063	Nitric acid mfg - ammonia oxid new	7999	Other process/not specified
7064	Nitric acid mfg - ammonia oxid old		
7131	Oxidation, biological		

TABLE G-8**MISCELLANEOUS PROCESSES****DRYING (Kilns/Dryers/Ovens)**

7002 Pigment drying
 7003 Spray drying
 7004 Veneer drying
 7005 Drying - other/not specified

MATERIAL HANDLING

7116 Bagging/packaging
 8007 Coke storage pile
 7007 Drying
 7045 Granulating
 7008 Grinding
 7009 Loading - storage tank
 7010 Loading - tank car
 7108 Milling
 7011 Mixing
 7115 Pelletizing
 7017 Pumping facility - organic liquids
 7012 Sanding
 7014 Storage
 7013 Material handling - other/not spec

MISCELLANEOUS

7109 Abrasives blasting
 7109 Cleaning - abrasives blasting
 8001 Coating operation - powder, other non-solvent
 8010 Conveying

7164 Composting - windows
 7165 Composting - aerated static piles
 7166 Composting - in-vessel
 7105 Cooling - pond
 7104 Cooling - tower
 7106 Cooling - other
 8011 Crematory retort
 8003 Expanders - plastics, other
 8004 Extruders - plastics, other
 7045 Granulating
 7143 Insulation stripping - wire
 7143 Laser-stripping - wire insulation
 7170 Latex dipping
 8005 Material working equipment - plastics, other
 7111 Molding/curing - plastics
 7112 Molding/curing - rubber
 7113 Molding/curing - other/not specified
 8002 Oven
 8006 Paper/paperboard handling equipment
 7109 Sand blasting
 7079 Sawmill operation
 8008 Screening/Separating
 8009 Shredding/Mangling/Cutting
 8012 Waste material grinding
 7161 Wastewater - industrial storage ponds
 7143 Wire insulation stripping - laser
 7107 Woodworking - other/not specified
 8999 Other process - not specified

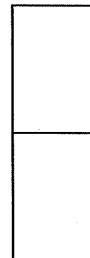
TABLE G-9**FUGITIVE EMISSION SOURCES****FUGITIVE EMISSIONS**

9000 Combined fugitive emission sources
 9010 Refinery flaring/blowdown
 9070 Refinery pressure relief valves
 9080 Refinery process drains
 9040 Refinery process vessels
 9060 Refinery pumps/compressors
 9030 Refinery vacuum products
 9050 Refinery valves/flanges

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

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Form P is for well-defined emission points such as stacks or chimneys only; do not use for windows, room vents, etc.



Business Name: Shell Oil Products US Plant No: _____

Emission Point No: P-1

With regard to air pollutant flow into this emission point, what source(s) and/or abatement device(s) are **immediately** upstream?

S- 1 S- _____ S- _____ S- _____ S- _____
 S- _____ A- 1 A- _____ A- _____ A- _____ A- _____

Exit cross-section area: 8.03 sq. ft. Height above grade: 13 ft.

Effluent Flow from Stack

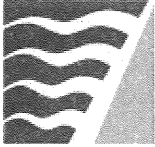
	<i>Typical Operating Condition</i>	<i>Maximum Operating Condition</i>
<i>Actual Wet Gas Flowrate</i>	1,100 cfm	1,600 cfm
<i>Percent Water Vapor</i>	1.8 Vol %	1.8 Vol %
<i>Temperature</i>	700 °F	1,200 °F

If this stack is equipped to measure (monitor) the emission of any air pollutants,

Is monitoring continuous? yes no

What pollutants are monitored? Total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene and xylenes (BTEX), and methyl tertiary butyl ether (MTBE)

Person completing this form Vanessa Marin Date 2/19/2013



BAY AREA AIR QUALITY MANAGEMENT DISTRICT

939 Ellis Street, San Francisco, CA 94109
Engineering Division (415) 749-4990
www.baaqmd.gov fax (415) 749-5030

Form P-101B
Authority to Construct/
Permit to Operate

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1. Application Information

BAAQMD Plant No. _____ Company Name Shell Oil Products US
Equipment/Project Description Soil Vapor Extraction System

2. Plant Information *If you have not previously been assigned a Plant Number by the District or if you want to update any plant data that you have previously supplied to the District, please complete this section.*

Equipment Location 4212 First Street
City Pleasanton Zip Code 94566
Mail Address 20945 S. Wilmington Ave
City Carson State CA Zip Code 90810-1039
Plant Contact Denis L. Brown Title Project Manager
Telephone 707-865-0251 Fax 707-865-2542 Email denis.l.brown@shell.com

NAICS (North American Industry Classification System) see www.census.gov/epcd/naics02/naico602.htm _____

3. Proximity to a School (K-12)

The sources in this permit application (check one) Are Are not within 1,000 ft of the outer boundary of the nearest school.

4. Application Contact Information *All correspondence from the District regarding this application will be sent to the plant contact unless you wish to designate a different contact for this application.*

Application Contact Jeff Schrupp Title Engineer
Mail Address 5900 Hollis Street, Suite A
City Emeryville State CA Zip Code 94608
Telephone (510) 420-3362 Fax (510) 420-9170 Email jschrupp@craworld.com

5. Additional Information *The following additional information is required for all permit applications and should be included with your submittal. Failure to provide this information may delay the review of your application. Please indicate that each item has been addressed by checking the box. Contact the Engineering Division if you need assistance.*

- If a new Plant, a local street map showing the location of your business
- A facility map, drawn roughly to scale, that locates the equipment and its emission points
- Completed data form(s) and a pollutant flow diagram for each piece of equipment. (See www.baaqmd.gov/Forms/Engineering.aspx)
- Project/equipment description, manufacturer's data
- Discussion and/or calculations of the emissions of air pollutants from the equipment

6. Trade Secrets *Under the California Public Records Act, all information in your permit application will be considered a matter of public record and may be disclosed to a third party. If you wish to keep certain items separate as specified in Regulation 2, Rule 1, Section 202.7, please complete the following steps.*

- Each page containing trade secret information must be labeled "trade secret" with the trade secret information clearly marked.
- A second copy, with trade secret information blanked out, marked "public copy" must be provided.
- For each item asserted to be trade secret, you must provide a statement which provides the basis for your claim.

7. Small Business Certification You are entitled to a reduced permit fee if you qualify as a small business as defined in Regulation 3. In order to qualify, you must certify that your business meets all of the following criteria:

- The business does not employ more than 10 persons and its gross annual income does not exceed \$600,000.
- And the business is not an affiliate of a non-small business. (Note: a non-small business employs more than 10 persons and/or its gross income exceeds \$600,000.)

8. Accelerated Permitting The Accelerated Permitting Program entitles you to install and operate qualifying sources of air pollution and abatement equipment **without waiting for the District to issue a Permit to Operate**. To participate in this program you must certify that your project will meet all of the following criteria. Please acknowledge each item by checking each box.

- Uncontrolled emissions of any single pollutant are each less than 10 lb/highest day, or the equipment has been precertified by the BAAQMD.
- Emissions of toxic compounds do not exceed the trigger levels identified in Table 2-5-1 (see Regulation 2, Rule 5).
- The project is not subject to public notice requirements (the source is either more than 1000 ft. from the nearest school, or the source does not emit any toxic compound in Table 2-5-1).
- For replacement of abatement equipment, the new equipment must have an equal or greater overall abatement efficiency for all pollutants than the equipment being replaced.
- For alterations of existing sources, for all pollutants the alteration does not result in an increase in emissions.
- Payment of applicable fees (the minimum permit fee to install and operate each source). See Regulation 3 or contact the Engineering Division for help in determining your fees.

9. CEQA Please answer the following questions pertaining to CEQA (California Environmental Quality Act).

- A. Has another public agency prepared, required preparation of, or issued a notice regarding preparation of a California Environmental Quality Act (CEQA) document (initial study, negative declaration, environmental impact report, or other CEQA document) that analyzes impacts of this project or another project of which it is a part or to which it is related? YES NO If no, go to section 9B.

Describe the document or notice, preparer, and date of document or expected date of completion:

Not applicable

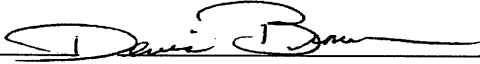
- B. List and describe any other permits or agency approvals required for this project by city, regional, state or federal agencies:

Performing remediation by order of Alameda County Environmental Health Department

- C. List and describe all other prior or current projects for which either of the following statements is true: (1) the project that is the subject of this application could not be undertaken without the project listed below, (2) the project listed below could not be undertaken without the project that is the subject of this application:

The soil vapor extraction and treatment system will not be built and operated if its operation is not permitted.

10. Certification I hereby certify that all information contained herein is true and correct. (Please sign and date this form)

<u>Denis Brown</u>	<u>Project Manager</u>		<u>3/26/13</u>
Name of person certifying (print)	Title of person certifying	Signature of person certifying	Date

Send all application materials to the BAAQMD Engineering Division, 939 Ellis Street, San Francisco, CA 94109.

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

939 Ellis Street . . . San Francisco, CA 94109 . . . (415) 749-4990 . . . FAX (415) 749-5030 OR 4949
 WEBSITE: WWW.BAAQMD.GOV

Health Risk Screening Analysis

IMPORTANT: For any permit application that requires a Health Risk Screening Analysis, fill out one form for each source that emits a Toxic Air Contaminant(s) [or for a group of sources that exhaust through a common stack]. Emissions can be from a discrete point source (with stack) or a source with fugitive emissions (area or volume source). You must provide a plot plan (drawn to scale, if possible) and a local map (aerial photos are recommended), which clearly demonstrate the location of your site, the source(s), property lines, and any surrounding buildings [see attached example]. Label streets, schools, residences, and other businesses. List major dimensions of all buildings surrounding the source in Section C.

Plant Name: Shell Oil Products US - 4212 First Street, Pleasanton Plant No.: _____

Source Description: Soil Vapor Extraction –Soil Remediation

Source No.: S-1 Emission Point No.: P-1
 (if known) (if known)

SECTION A (Point Source)

1. Does the source exhaust at clearly defined emission point; i.e., a stack or exhaust pipe? YES OR NO
 (If YES continue at #2, If NO, skip to Section B)
2. Does the stack (or exhaust pipe) stand alone or is it located on the roof of a building? alone OR on roof
Important: If stack is on a roof, provide building dimensions on line B1 in Section C.
3. What is the height of the stack outlet above ground level? 13 feet OR _____ meters?
4. What is the inside diameter of the stack outlet? 34"x 34" square inches OR _____ feet OR _____ meters
5. What is the direction of the exhaust from the stack outlet? horizontal OR vertical
6. Is the stack outlet: open or hinged rain flap OR rain capped (deflects exhaust downward or horizontally)
7. What is the exhaust flowrate during normal operation? 500 cfm (cubic feet/min) OR _____ meters³/second
8. What is the typical temperature of the exhaust gas? 700 degrees Fahrenheit OR _____ degrees Celsius
 (Skip Section B and Go on to Section C)

SECTION B (Area/Volume Source)

This section applies to fugitive emissions that are NOT captured by a collection system nor directly emitted through a stack or other emission point. Volume sources have fugitive emissions generally released within a building or other defined space (e.g., dry cleaner, gasoline station canopy). Area sources are generally flat areas of release (e.g., landfill, quarry).

1. Is the emission source located within a building? YES (go to #2) OR NO (go to #3)
2. If YES (source inside building), provide building dimensions on line B1 in Section C
 - a. Does the building have a ventilation system that is vented to the outside? YES OR NO
 - b. If NO (ventilation), are the building's doors & windows kept open during hours of operation? YES OR NO
3. If NO (source not inside building), provide a description of the source, dimensions, & indicate location on plot plan.
See site plan

(Go on to Section C)

SECTION C (Building Dimensions)

Provide building dimensions. Use Line B1 only for building with source/stack on the roof or with fugitive emissions inside building. Use Lines B2-B9 for buildings surrounding the source (within 300 feet). Distance and direction are optional if map and/or aerial photo are adequately labeled with locations of buildings. Check one for units: feet OR meters

B#	Building name or description	Height	Width	Length	Distance To Source	Direction To Source
B1	NA					
B1	Residential	15	40	47	260	SW
B2	Residential	15	23	33	270	SW
B3	Residential	25	30	40	270	SW
B4	Residential	25	24	30	270	SW
B5	Residential	25	45	50	270	S
B6	Residential	25	40	100	240	S
B7	Residential	25	50	80	180	S
B8	Commercial-Industrial	15	35	70	60	SW
B9	Residential	15	30	35	95	S
B10	Residential	30	50	80	140	SE
B11	Residential	25	30	35	50	S
B12	Residential	15	50	80	130	SE
B13	Residential	25	35	60	35	E
B14	Residential	15	33	33	65	E
B15	Residential	20	50	80	170	E
B16	Residential	15	25	57	100	N
B17	Residential	15	32	45	100	NE
B18	Residential	15	50	70	230	NE
B19	Residential	15	50	60	150	N
B20	Residential	15	50	70	280	NE
B21	Residential	15	48	62	290	NE
B22	Commercial-Industrial	20	30	50	190	NW
B23	Residential	15	60	20	150	NE

NOTE: Label buildings by B# on plot plan, map and/or aerial photo. Provide comments below for any details that need additional clarification (e.g., list buildings that are co-occupied by your employees and other workers, residents, students, etc).

(Go on to Section D)

SECTION D (Receptor Locations)

NOTE: Indicate on maps or aerial photos the residential and nonresidential areas surrounding your facility.

- Indicate the area where the source is located (check one):
 - zoned for residential use
 - zoned for mixed residential and commercial/industrial use

zoned for commercial and/or industrial use zoned for agricultural use

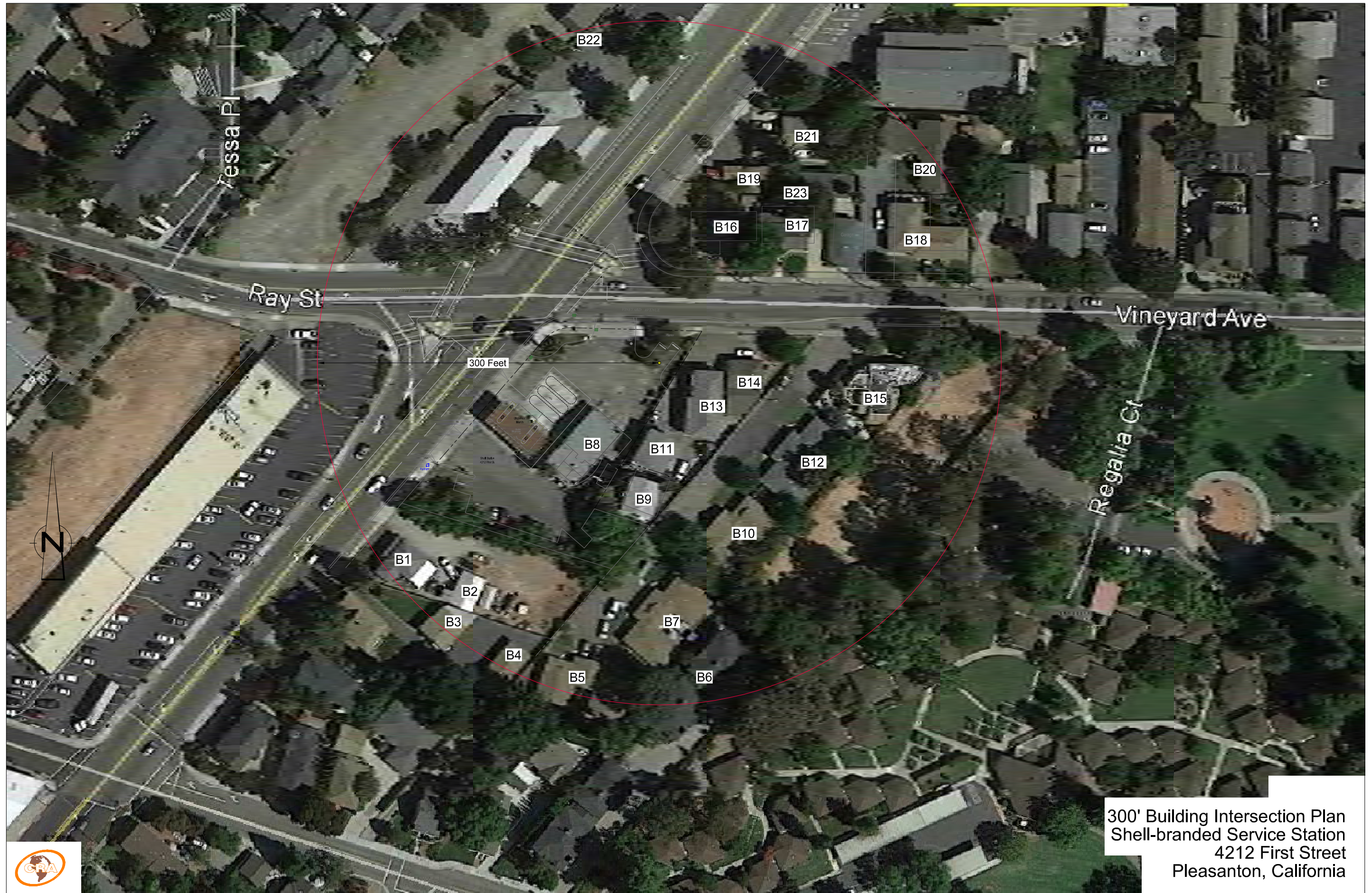
2. Distance from source (stack or building) to nearest facility property line 15 feet OR _____ meters
3. Distance from source (stack or building) to the property line of the nearest residence 15 feet OR _____ meters
4. Describe the nearest nonresidential property (check one): Industrial/Commercial OR Other _____
Gas Station

5. Distance from source (stack or building) to property line of nearest nonresidential site 175 feet OR _____ meters

6. Distance from source to property line of nearest school* (or school site) _____ feet OR Greater than 1,000 feet
[Note: Helpful website with California Dept. of Education data: www.greatschools.net]

Provide the names and addresses of all schools* that have property line(s) within 1,000 feet of the source:

Not Applicable



300' Building Intersection Plan
Shell-branded Service Station
4212 First Street
Pleasanton, California



APPENDIX B

SITE HISTORY

SITE HISTORY

1985 Subsurface Investigation: In September 1985, Emcon Associates (Emcon) drilled one soil boring (S-A) adjacent to the waste oil underground storage tank (UST), and drilled three soil borings (S-B through S-D) and installed one groundwater monitoring well (S-1) adjacent to the gasoline USTs. Soil samples contained up to 1,300 milligrams per kilogram (mg/kg) total petroleum hydrocarbons as gasoline (TPHg), 9.6 mg/kg toluene, and 260 mg/kg total xylenes and ethylbenzene. Benzene was not detected in the soil samples. The monitoring well was dry. Emcon's November 12, 1985 letter presents investigation details.

1986 Subsurface Investigation: In March 1986, one soil boring (S-E) was drilled adjacent to product lines. No TPHg, or benzene, toluene, ethylbenzene, and total xylenes (BTEX) were detected in soil samples.

1986 UST Removal: In May 1986, Blaine Tech Services (Blaine) collected soil samples following removal of four gasoline USTs and one waste oil UST. Soil samples from the gasoline UST excavation contained up to 240 mg/kg TPHg. Hydrocarbons were not detected in a soil sample collected from the waste oil tank excavation. Three 10,000-gallon, double-walled, fiberglass tanks were installed at a location closer to the dispenser islands.

1988 Gasoline Spill: In August 1988, approximately 40 gallons of gasoline were spilled in the area of the pump islands. Impacted soil was removed to a depth of 1 to 2 feet below grade (fbg).

1990 Subsurface Investigations: In March 1990, Hart Crowser, Inc. (Hart) drilled three soil borings (SB-1 through SB-3) and destroyed one groundwater monitoring well (S-1). Following the well destruction, Hart continued drilling a boring (WA-1) below the depth of the monitoring well. Soil samples contained up to 380 mg/kg TPHg, 2.2 mg/kg benzene, 2.7 mg/kg toluene, 5.3 mg/kg ethylbenzene, and 32 mg/kg total xylenes. Hart's April 23, 1990 *Report of Supplemental Site Assessment* provides details of this investigation.

In July 1990, Hart drilled two additional soil borings (SB-4 and SB-5) down gradient from the former UST complex. Soil samples contained up to 820 mg/kg TPHg, 65 mg/kg benzene, 3.7 mg/kg toluene, 6.5 mg/kg ethylbenzene, and 65 mg/kg total xylenes (SB-5 at 35 fbg). Hart's December 11, 1990 *Supplemental Site Assessment* presents the soil boring investigation details.

1995 Dispenser and Piping Replacement: In September 1995, Paradiso Mechanical of San Leandro, California removed the product lines and replaced the dispensers and piping. Weiss Associates (Weiss) collected soil samples from beneath the gasoline product piping (PT-1 and PT-2) and dispensers (DP-1 through DP-4). Soil samples contained up to 120 mg/kg TPHg, 0.038 mg/kg ethylbenzene, and 0.19 mg/kg total xylenes. Benzene and toluene were not detected in the soil samples. Approximately 40 cubic yards of soil were over-excavated at the direction of the Pleasanton Fire Department. Weiss' December 21, 1995 *Dispenser Replacement Sampling* report presents soil sampling locations and results.

1998 Facility Upgrade: In July 1998, Cambria Environmental Technology, Inc. (Cambria) inspected the waste oil tank remote-fill piping during its removal by Gettler-Ryan of Dublin, California. No hydrocarbon impact was observed during the site visit, and, therefore, no sampling was required. A pea gravel sample contained 27 mg/kg total petroleum hydrocarbons as diesel (TPHd). Cambria's September 2, 1998 *Upgrade Site Inspection Report* provides inspection details.

1999 Subsurface Investigation: In April 1999, Cambria drilled two soil borings (SB-6 and SB-7) and converted SB-6 to monitoring well MW-1. Soil samples contained up to 83 mg/kg TPHg, 0.10 mg/kg benzene, 0.37 mg/kg toluene, 0.26 mg/kg ethylbenzene, and 0.26 mg/kg total xylenes. Methyl tertiary-butyl ether (MTBE) was not detected in soil samples. Grab groundwater samples contained up to 10,000 micrograms per liter ($\mu\text{g/l}$) TPHg, 4,500 $\mu\text{g/l}$ benzene, 3.4 $\mu\text{g/l}$ ethylbenzene, and 2.9 $\mu\text{g/l}$ total xylenes. Toluene and MTBE were not detected in the grab groundwater samples. Cambria's August 12, 1999 *Subsurface Investigation Report* presents investigation details.

2000 Subsurface Investigation: In January 2000, Cambria installed two wells (MW-2 and MW-3) to determine whether groundwater had been impacted by petroleum hydrocarbons. No petroleum hydrocarbons or MTBE were detected in soil samples. Cambria's June 23, 2000 *Subsurface Investigation Report* presents well installation details.

2004 Well Survey: In May 2004, Toxichem Management Systems, Inc. (Toxichem) conducted a well survey, which identified a municipal well (3S/1E-21B1) and a well of unknown use (3S/1E-21B) approximately 900 feet northeast of the site and another municipal well (3S/1E-16P1) approximately 1,200 feet north of the site. The locations of the wells could not be field verified.

2005 UST Upgrades: In January 2005, Town and Country Contractors, Inc. (T & C) upgraded the gasoline USTs.

2005 Tank Backfill Well Destructions: In January 2005, T & C destroyed four tank backfill wells (TB-1 through TB-4).

2005 Waste Oil UST Investigation: In January 2005, an unknown liquid was likely poured into a port on the waste oil UST which led directly into the pea gravel surrounding the UST. Based on this observation, Shell submitted a UST Unauthorized Release (Leak)/Site Contamination Report on January 19, 2005. Able Maintenance (Able) and Service Station Systems sealed the UST port with epoxy and excavated pea gravel around the UST. Toxichem collected pea gravel samples which contained 1.4 mg/kg TPHg, 1,400 mg/kg TPHd, and 10,000 mg/kg total petroleum hydrocarbons as oil and grease. In June 2005, Delta Consultants (Delta) drilled one soil boring (WO-1) adjacent to the waste oil UST to determine if the liquid poured into the pea gravel had impacted soils. Petroleum hydrocarbons were not detected in the soil samples. Delta's July 11, 2005 *Soil and Water Investigation Report* provides investigation details.

2005 Receptor Survey: In September 2005, Delta conducted a well survey which located an old water tower in the area of the wells identified in Toxichem's 2004 well survey and identified a water supply well (3S/1E-21C1) and an irrigation well (3S/1E-21C4) approximately 1,000 feet northwest of the site and another irrigation well in Kottinger Park, approximately 800 feet east of the site. Delta identified the nearest surface water as Arroyo del Valle Creek located approximately 1,130 feet northwest of the site.

2006 Waste Oil UST Removal: In July 2006, Wayne Perry Inc. removed a 550-gallon waste oil UST. Cambria collected a soil sample from the bottom of the UST excavation (WO-2) which contained 26 mg/kg oil and grease, 5.5 mg/kg TPHd, 0.021 mg/kg MTBE, 40.7 mg/kg chromium, 6.00 mg/kg lead, 46.9 mg/kg nickel, and 52.5 mg/kg zinc. Based on these concentrations, Shell submitted a UST Unauthorized Release (Leak)/Site Contamination Report on July 28, 2006. Cambria's September 21, 2006 *UST Removal Report* details the UST removal and sampling.

2006 Subsurface Investigation: In August and September 2006, Delta installed two monitoring wells (MW-1B and MW-4) and drilled two cone penetrometer test (CPT) borings (CPT-2 and CPT-3). Well MW-4 was installed in first-encountered groundwater, and well MW-1B was installed in a deeper water-bearing zone. Soil samples from well boring MW-4 contained up to 380 mg/kg TPHg, 1.2 mg/kg ethylbenzene, 1.6 mg/kg xylenes, and 0.59 mg/kg MTBE. TPHg, BTEX, MTBE, and tertiary-butyl alcohol (TBA) were not detected in soil samples from MW-1B, and benzene, toluene, and TBA were not detected in soil samples from MW-4. Grab groundwater samples from off-site CPT boring CPT-2 contained up to

0.99 µg/l benzene, 47 µg/l MTBE, and 27 µg/l TBA. Grab groundwater samples from on-site CPT boring CPT-3 contained up to 700 µg/l TPHg, 0.78 µg/l ethylbenzene, 2.1 µg/l xylenes, 79 µg/l MTBE, and 2,000 µg/l TBA. Delta's October 31, 2006 *Soil and Groundwater Investigation Report* provides well installation and CPT investigation details.

2007 Subsurface Investigation: In March 2007, Delta drilled five soil borings (B-1 through B-5) in or near on-site source areas. Soil samples from the soil borings contained up to 710 mg/kg TPHg, 2.3 mg/kg ethylbenzene, 16 mg/kg xylenes, 0.78 mg/kg MTBE, and 0.80 mg/kg TBA. Delta's June 25, 2007 *Site Investigation and Interim Remediation Report* provides details of this investigation.

2007 Mobile Groundwater Extraction (GWE): From June through August 2007, Delta extracted approximately 4,226 gallons of groundwater from MW-4. Delta's June 25, 2007 *Site Investigation and Interim Remediation Report* and November 2, 2007 *Draft Corrective Action Plan (CAP)* provide remediation details.

2009 Dual-Phase Extraction (DPE) Pilot Test: In January 2009, Delta conducted a 5-day DPE pilot test on MW-4 and 4-hour DPE pilot tests on MW-1 and MW-2. Prior to conducting the DPE pilot tests, Delta conducted step drawdown tests in MW-1 and MW-4. Delta calculated hydraulic conductivities of 3.59×10^{-5} centimeters per second (cm/sec) in MW-1 at a pumping rate of 0.48 gallons per minute (gpm) and 3.17×10^{-5} cm/sec in MW-4 at a pumping rate of 0.40 gpm. Based on the results of the DPE pilot test, Delta calculated a theoretical radius of influence of 26 feet for soil vapor extraction and estimated that 286.3 pounds of hydrocarbons were removed from the vadose zone. An estimated 0.23 pounds of dissolved hydrocarbons were removed along with 2,748 gallons of groundwater. Delta concluded that while GWE results indicated it was likely not a viable remediation strategy, soil vapor extraction (SVE) could be a viable remediation alternative. Delta's February 12, 2009 *DPE Pilot Test Report* provides pilot test data.

2009 Dispenser Repairs: In January 2009, Able replaced the faulty pan beneath the south dispenser on the pump island closest to the station building. Delta collected a soil sample (Under Dispenser #1) from the dispenser excavation. No TPHg, TPHd, BTEX, fuel oxygenates, or lead scavengers were detected in the soil sample. Delta's March 6, 2009 *Dispenser Repair Report* presents details of the repair and soil sampling.

2010 Subsurface Investigation: In January 2010, Delta installed one observation well (OBS-1), one air sparging (AS) well (AS-1), and four SVE wells (SVE-1 through SVE-4). Delta's June 7, 2010 *2010 AS Pilot Test Report* provides well installation details.

2010 AS Pilot Test: In January 2010, Delta conducted an AS pilot test using well AS-10. Delta calculated an air sparging radius of influence of 31 feet; however, Conestoga-Rovers & Associates' (CRA's) subsequent analysis of the pilot test data determined that the test was flawed and therefore inconclusive. Delta's June 7, 2010 *2010 AS Pilot Test Report* details pilot testing results.

2011 Subsurface Investigation: In June 2011, CRA attempted to install two off-site wells across Vineyard Avenue from the site. CRA abandoned the well installation attempts because there were no other locations in the sidewalk where the wells could be installed safely due to the interference of underground utilities. CRA's July 28, 2011 letter provides investigation details.

2012 Subsurface Investigation: In August and September 2012, CRA installed and sampled eight soil vapor probes. No constituents of concern were detected in any soil vapor samples, with the exception of up to 53 micrograms per cubic meter toluene. All toluene concentrations are below residential environmental screening levels. CRA's October 3, 2012 *Subsurface Investigation Report* presents soil vapor investigation results.

2012 AS/SVE and DPE Pilot Testing: In September 2012, CRA conducted AS/SVE and DPE pilot tests in the area of MW-4 and the former USTs. Based on the results of these pilot tests, neither AS/SVE nor DPE remedial technologies removed significant quantities of benzene or MTBE. CRA's October 30, 2012 *Air Sparge and Soil Vapor Extraction and Dual-Phase Extraction Pilot Test Reports* present pilot testing details.

Groundwater Monitoring Program: Groundwater monitoring and sampling began in June 1999. The depth to first-encountered groundwater typically ranges between 31 to 34 fbg. Groundwater flow is generally northwesterly.

APPENDIX C

PILOT TEST DATA TABLES

TABLE 1

AIR SPARGE/SOIL VAPOR EXTRACTION PILOT TEST
VAPOR ANALYTICAL DATA
SHELL-BRANDED SERVICE STATION
4212 FIRST STREET, PLEASANTON, CALIFORNIA

Well ID	Date and Time	TPHg (ppmv)	MTBE (ppmv)	Benzene (ppmv)	Toluene (ppmv)	Ethylbenzene (ppmv)	Xylenes (ppmv)
EW-1	9/11/12 7:30	<24	<0.55	<0.63	<0.53	<0.46	<1.4
	9/11/12 19:00	<24	<0.55	<0.63	<0.53	<0.46	<1.4
	9/12/12 9:00	<24	<0.55	<0.63	<0.53	<0.46	<1.4
	9/12/12 11:00	<24	<0.55	<0.63	<0.53	<0.46	<1.4
	9/12/12 18:00	<24	<0.55	<0.63	<0.53	<0.46	<1.4
MW-4	9/12/12 18:00	550	18	<0.63	<0.53	0.79	<1.4
EW-2	9/12/12 9:00	3,800	<2.8	<3.1	<2.7	<2.3	<6.9
	9/12/12 11:00	<24	<0.55	<0.63	<0.53	<0.46	<1.4
	9/12/12 18:00	<24	<0.55	<0.63	<0.53	<0.46	<1.4
P-2	9/11/12 7:30	580	<0.55	<0.63	<0.53	<0.46	<1.4
	9/11/12 19:00	<24	<0.55	<0.63	<0.53	<0.46	<1.4
	9/12/12 9:00	<24	<0.55	<0.63	<0.53	<0.46	<1.4
	9/12/12 11:00	<24	<0.55	<0.63	<0.53	<0.46	<1.4
	9/12/12 18:00	<24	<0.55	<0.63	<0.53	<0.46	<1.4
SVE-3	9/11/12 7:30	170	<0.55	<0.63	<0.53	<0.46	<1.4
	9/11/12 19:00	<24	<0.55	<0.63	<0.53	<0.46	<1.4
	9/12/12 9:00	<24	<0.55	<0.63	<0.53	<0.46	<1.4
	9/12/12 11:00	<24	<0.55	<0.63	<0.53	<0.46	<1.4
	9/12/12 18:00	<24	<0.55	<0.63	<0.53	<0.46	<1.4
SVE-4	9/11/12 7:30	<24	<0.55	<0.63	<0.53	<0.46	<1.4
	9/11/12 19:00	190	<0.55	<0.63	<0.53	<0.46	<1.4
	9/12/12 9:00	100	<0.55	<0.63	<0.53	<0.46	<1.4
	9/12/12 11:00	33	<0.55	<0.63	<0.53	<0.46	<1.4
	9/12/12 18:00	<24	<0.55	<0.63	<0.53	<0.46	<1.4
SVE-5	9/11/12 7:30	<24	<0.55	<0.63	<0.53	<0.46	<1.4
	9/11/12 16:15	1,400	<0.55	0.80	<0.53	2.2	3.0
	9/11/12 19:00	1,000	<0.55	1.0	<0.53	2.2	3.0
	9/12/12 9:00	1,000	<0.55	0.74	<0.53	2.1	4.5
	9/12/12 10:10	630	<0.55	1.3	<0.53	3.0	6.4
	9/12/12 11:00	370	<0.55	0.74	<0.53	1.5	2.5
	9/12/12 12:15	190	<0.55	<0.63	<0.53	0.79	1.5
	9/12/12 14:00	510	<0.55	0.72	<0.53	1.1	1.8
	9/12/12 16:00	370	<0.55	0.80	<0.53	1.1	1.7
9/12/12 18:00	300	<0.55	<0.63	<0.53	0.61	<1.4	
INF-2	9/11/12 12:45	710	<0.55	0.75	<0.53	3.6	6.3
	9/11/12 19:00	1,200	<0.55	1.1	<0.53	3.3	6.1
	9/12/12 10:10	570	<0.55	1.2	<0.53	2.5	5.1
	9/12/12 11:00	550	<0.55	0.91	<0.53	3.0	6.2
	9/12/12 12:15	650	<0.55	1.4	<0.53	3.6	8.3
	9/12/12 14:00	720	<0.55	1.0	<0.53	3.4	6.8
	9/12/12 16:00	740	<0.55	1.7	<0.53	4.3	9.0
	9/12/12 18:00	1,100	<0.55	1.4	<0.53	4.2	8.7

Abbreviations and Notes:

TPHg = total petroleum hydrocarbons as gasoline by EPA Method TO-3M

MTBE = methyl tertiary-butyl ether by EPA Method 8260B

BTEX = benzene, toluene, ethylbenzene, and xylenes by EPA Method 8260B

ppmv = parts per million by Volume

<x = less than the laboratory method reporting limit

NA = not analyzed

TABLE 2
 AIR SPARGE/SOIL VAPOR EXTRACTION PILOT TEST
 SOIL VAPOR EXTRACTION DATA
 SHELL-BRANDED SERVICE STATION
 4212 FIRST STREET, PLEASANTON, CALIFORNIA

Date/Time	Cumulative Operation (hours)	Hour meter (Hrs)	Infl-1 Vacuum (in.WC)	Infl-1 Temp. (°F)	Infl-1 Vapor Flow Rate		Infl-1 Vapor Conc. (ppmv)	Infl-1 Helium Conc. (ppmv)	Blower Vac (in. Hg)	Inf-2 Pressure (in.WC)	Inf-2 Temp. (°F)	Infl-2 Vapor Flow Rate			Infl-2 Vapor Conc. (ppmv)	Infl-2 Hydrocarbon Concentrations (ppmv)			TPHg		Benzene		MTBE		Notes
					(acfm)	(scfm)						(fpm)	(acfm)	(scfm)		TPHg	Benzene	MTBE	Removal Rate (lbs/day)	Cumulative Removed (lbs)	Removal Rate (lbs/day)	Cumulative Removed (lbs)	Removal Rate (lbs/day)	Cumulative Removed (lbs)	
9/12/12 9:20	0.00	6831.0	46.2	71.4	134	118.0	>15,000 A	NM	15.0	0.35	163	2,400	209	177.7	>15,000 A				37.777	0.000	0.062	0.000	0.032	0.000	Start SVE on SVE-5
9/12/12 9:50	0.6	6831.6	72.7	75.0	172	139.4	926	NM	15.5	0.35	159	2,400	209	178.8	930				38.021	0.951	0.062	0.002	0.032	0.001	
9/12/12 10:10	1.0	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM				38.021	1.584	0.062	0.003	0.032	0.001	
9/12/12 10:20	1.1	6832.1	100.1	76.8	218 b	161.7	745	NM	15.5	0.30	158	2,300	201	171.6	863				35.851	1.734	0.053	0.003	0.031	0.001	
9/12/12 10:50	1.5	6832.5	102.1	75.3	218 b	161.1	675	NM	14.0	0.45	160	2,600	227	193.4	815				40.412	2.407	0.061	0.004	0.036	0.002	
9/12/12 11:00	1.7	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM				39.690	2.738	0.052	0.004	0.036	0.002	
9/12/12 11:20	2.0	6833.0	102.7	66.3	217	162.7	625	NM	14.5	0.45	161	2,600	227	193.1	765				43.228	3.278	0.066	0.005	0.036	0.003	
9/12/12 11:45	2.5	6833.5	101.9	66.2	218 b	164.0	673	NM	14.5	0.40	161	2,500	218	185.7	781				41.561	4.144	0.064	0.006	0.034	0.004	
9/12/12 12:15	2.9	6833.9	101.6	66.0	218 b	164.2	800	NM	14.5	0.45	163	2,600	227	192.5	966				46.680	4.922	0.063	0.007	0.035	0.004	
9/12/12 12:45	3.6	6834.6	100.5	67.2	218 b	164.4	820	NM	15.0	0.45	162	2,600	227	192.8	964				49.273	6.359	0.069	0.009	0.036	0.005	
9/12/12 13:30	4.2	6835.2	98.5	66.8	218 b	165.6	953	NM	15.0	0.48	162	2,650	231	196.5	1,070				50.224	7.615	0.070	0.011	0.036	0.006	
9/12/12 14:00	4.7	6835.7	98.1	67.3	218 b	165.7	1,078	NM	15.0	0.45	163	2,600	227	192.5	1,310				51.708	8.692	0.057	0.012	0.035	0.007	
9/12/12 15:00	5.7	6836.7	98.4	66.1	218 b	165.9	976	NM	15.0	0.48	164	2,650	231	195.9	1,347				53.352	10.915	0.079	0.016	0.036	0.008	
9/12/12 15:30	6.2	6837.2	98.5	64.5	218 b	166.3	1,083	2.1%	15.0	0.50	164	2,700	236	199.6	1,365				54.362	12.048	0.080	0.017	0.037	0.009	
9/12/12 16:00	6.7	6837.7	98.2	66.5	218 b	165.9	864	4,650	15.0	0.50	169	2,700	236	198.0	1,015				54.668	13.187	0.100	0.019	0.037	0.010	
9/12/12 17:00	7.7	6838.7	96.3	65.1	218 b	167.3	991	2.4%	15.0	0.55	169	2,800	244	205.4	1,170				70.492	16.124	0.095	0.023	0.038	0.011	
9/12/12 18:00	8.8	6839.8	97.9	65.8	218 b	166.2	1,030	2,250	15.0	0.55	164	2,800	244	207.0	1,267				84.959	20.018	0.086	0.027	0.038	0.013	

Total Pounds Extracted: 20.0 0.027 0.013
 Averaged Daily Extraction Rate 54.59 0.075 0.036

Abbreviations and Notes:

in. Hg = inches of mercury column.
 in.WC = inches of water column.
 acfm = actual cubic feet per minute.
 scfm = standard cubic feet per minute.
 °F = degrees fahrenheit
 lbs/day = pounds per day
 Infl-1 = pre-dilution
 Infl-2 = post dilution
 temp. = Temperature

Conc. = Concentration
 Atmospheric pressure = 406.86 in.wC.
 $scfm = acfm \times ((406.86 \text{ [in.wC]} + \text{discharge pressure [in.wC]}) / 406.86 \text{ [in.wC]}) \times (528 \text{ [°R]} / (\text{Discharge temperature [°F]} + 460))$
 TPHg = Total purgeable hydrocarbons as gasoline
 $\text{Removal/Emission Rate} = C \text{ (ppmv)} \times Q \text{ (cfm)} \times (1\text{lb-mole}/386\text{ft}^3) \times \text{MW (lb/lb-mole)} \times 60 \text{ min/hr} \times 24 \text{ hr/day} \times 10^{-6}$
 where; C = concentration, Q = flow, MW= molecular weight (100 lb/lb-mole for TPHg, 78 lb/lb-mole for benzene, and 88 lb/lb-mole for MTBE)
 - = not measured or not applicable
 a = Dilution flow not converted to scfm. The total flow is approximate.
 b= anemometer flow limit of 218 cfm reached. Flow is greater than or equal to 218 acfm.

APPENDIX D

VENDOR-SUPPLIED EQUIPMENT LITERATURE

Solleco 500 THERMAL CATALYTIC OXIDIZER

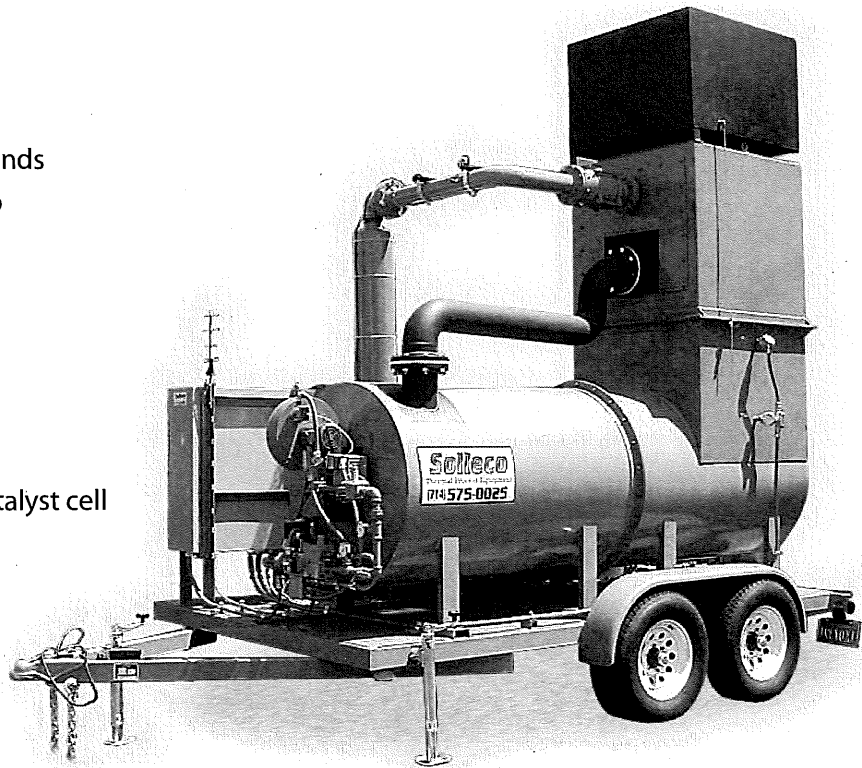
Standard Features

Skid mounted system (84" x 144")
200 gallon entrained liquid separator
Positive displacement blower
500 CFM and up to 14" Hg.
Blower re-circulation valve
20 HP TEFC motor – 3 Phase
A-36 steel oxidizer body with ceramic lining
Excess air burner package

NEMA 4 – NFPA Fuel train
NEMA 4 electrical enclosure
Digital temperature controller
Digital dilution controller
Digital high limit controller
2 Pen chart recorder
DP Transmitter with pitot tube
Analog hour meter

Standard Options

1. Double axle trailer with jack stands
2. Stainless steel auto drain pump
3. Soundproof enclosure with fan
4. 4 Point chart recorder
5. 6 Point chart recorder
6. Auto dialer telemetry system
7. Wireless telemetry capability
8. 50% efficient heat exchanger
9. Platinum coated monolithic catalyst cell
10. System CSA certification
11. SCAQMD certified permit



Utility Requirements

208/230 Volt – 3 Phase – 100 Amps
1000 scfh – 5 psi – LPG or Natural Gas

SOLLECO INC.
1270 NORTH RED GUM
ANAHEIM, CA 92806
(714) 575-0025 • FAX (714) 575-0026 • www.solleco.com

500 TCAT THERMAL / CATALYTIC OXIDIZER

TECHNICAL SPECIFICATIONS

Oxidizer Specifications:

Chamber Length	10 feet
Chamber Retention Time	1 second
Stack Exit Velocity	10 feet / second
Throat Velocity	40 feet / second
Stack Discharge Height	13 feet
Skid Dimensions	7 feet wide / 12 feet long
Trailer Dimensions	9 feet wide / 12 feet long
Chamber Dimensions	40" round outside - 30" round inside
Chamber Internal Lining	Ceramic Fiber
Chamber Mixing Throat Diameter	14" Round
Burner Size	1,000,000 btu/hr. (Maximum)
Destruction Efficiency	98% +
Maximum VOC Influent (Thermal)	12,000 ppmv (BTEX / MTBE)
Operating Temperature (Thermal)	1400° F to 1650° F
Maximum VOC Influent (Catalytic)	3,500 ppmv (BTEX / MTBE)
Operating Temperature (Catalytic)	600° F to 1200° F
Normal VOC Effluent	< 50 ppmv

Blower Specifications:

Blower Type	Roots URAI 59
Volumetric Flow	500 CFM maximum
Vacuum Level	Up to 14" Mercury
Motor Type	20 HP TEFC
RPM	1700 (average)

Catalyst Specifications:

Catalyst Type	Platinum Coated Metal Monolithic
Catalyst Size	23" O.D. x 3.5" Height
Catalyst Volume	.85 ft ³
Destruction Efficiency	98% +
Maximum VOC Influent	3500 ppmv (BTEX / MTBE)
Normal VOC Effluent	<50 ppmv

Utility Specifications:

Supplemental Fuel	Natural Gas or Propane
Fuel Pressure	2 to 5 psi (Maximum)
Fuel Volume	1,000 scfh (Maximum)
Electrical Requirements	208/230 Volt – 3 Phase - 100 Amps

VACUUM PERFORMANCE
FRAME 59 UNIVERSAL RAI BLOWER
 MAXIMUM VACUUM=15 IN. HG
 MAXIMUM SPEED=2850 RPM

