Andy Saberi
1045 Airport Boulevard
South San Francisco, CA 94080

Mr. Jerry Wickham
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: 1230 14th Street, Oakland, California
ACEH Case No. 295

Dear Mr. Wickham:

I, Mr. Andy Saberi, have retained Pangea Environmental Services, Inc. (Pangea) as an environmental consultant for the project referenced above. Pangea is submitting the attached report on my behalf.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached report are true and correct to the best of my knowledge.

If you have any questions, please call me at (650) 588-3088.

Sincerely,

Andy Saberi

March 15, 2012

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

Re: **SVE System Restart Results**
Soil Vapor Extraction (SVE) System
1230 14th Street, Oakland, California
BAAQMD Plant No. 20186
BAAQMD Application No. 21821

Dear Ms. Chan:

Pangea Environmental Services (Pangea) is submitting restart test results for the soil vapor extraction (SVE) system in operation at the subject site. Restart samples were collected on February 15 and 23, 2012. Described below are the system description, corrective action, system restart and sampling, and permit compliance.

SYSTEM DESCRIPTION

The SVE system consists of a 250 cubic foot per minute (cfm) positive displacement blower (S-1), electric catalytic oxidizer (A-1), and emission stack (P-1). The SVE system is the vapor portion of the combined soil vapor/groundwater [dual phase extraction (DPE)] system. Soil vapor and groundwater are simultaneously extracted from the subsurface using PVC piping and drop-tube stingers in up to five remediation wells. After extraction from the wells, the soil vapor process stream passes through a vapor/liquid separator, where any entrained groundwater is separated out and treated. From the vapor/liquid separator, soil vapor passes through the positive-displacement blower and is routed to the oxidizer for abatement before being discharged to the atmosphere. A 5 hp air sparge system cyclically injects up to about 4 to 8 cfm of air into site groundwater.

CORRECTIVE ACTION

Initial system startup results from May 5, 2011 indicated that destruction efficiencies were not within permitted limits as reported in Pangea's *SVE System Startup Results* report, dated May 19, 2011. To correct the problem, Pangea coordinated with the equipment manufacturer to inspect and repair the equipment. Repairs performed since May 2011 included repairing a hole in the heat exchanger, rebuilding the catalyst cell shelf, removing the muffler from the emission stack, and replacing the catalyst cell. Pangea checked influent and effluent concentrations with an Organic Vapor Analyzer (Horiba Model MEXA 324JU) and collected samples for laboratory analyses on February 15 and 23, 2012.

SYSTEM RESTART AND SAMPLING

The February 15, 2012 influent and effluent vapor samples were collected after system warm up during DPE *without* air sparging (AS). The February 23, 2012 samples were collected during DPE *with* AS that increased the influent hydrocarbon concentrations. SVE system performance data, flow rates, laboratory analytical data, organic vapor analyzer measurements, hydrocarbon removal rates, emission rates, and destruction efficiency

are summarized on attached Table 1. Laboratory analytical results are included in Attachment A.

PERMIT COMPLIANCE

Compliance with permit conditions is summarized below on Tables A and B. For the February 15 testing, given the influent vapor concentration on of 180 ppmv TPHg (<200 ppmv), the Authority to Construct (ATC) permit requires a minimum abatement/destruction efficiency of >90% TPHg. Based on February 15 data the equipment achieved abatement of >96.1% TPHg, which *does* meet the permit requirement. As shown on attached Table 1, the TPHg and benzene removal rates from the subsurface on February 15 were approximately 6.8 and 0.07 lbs/day, respectively. The estimated benzene emission rate was <0.003 lbs/day, which is substantially lower than the permitted limit of 0.021 lbs/day. The ATC also requires a maximum flow rate of 410 scfm and minimum oxidizer temperature of 600 degrees Fahrenheit.

Table A – Compliance Evaluation for SVE Restart Data for 2/15/12

Sample Location	TPHg Concentration (ppmv)	Benzene Mass Removal/Emissions (lbs/day)	Flow Rate (scfm)	Temp (°F)*
Influent	180	0.07	118	820
Effluent	<7.0	<0.003	118	927
Permit Limit	90% Abatement	0.021 lbs/day	410	>600
Pass/Fail	**Pass** (>96.1%)	**Pass**	**Pass**	**Pass**

* Thermocouples in oxidizer chamber transmit temperature data to temperature controllers on oxidizer control panel.

For February 23 data, given the influent vapor concentration of 860 ppmv TPHg (between 200 and 2,000 ppmv), the Authority to Construct (ATC) permit requires a minimum abatement/destruction efficiency of >97% TPHg. Based on February 23 data the equipment achieved abatement of 99.1% TPHg, which *does* meet the permit requirement. As shown on attached Table 1, the TPHg and benzene removal rates from the subsurface were approximately 36.1 and 0.32 lbs/day, respectively. The estimated benzene emission rate was <0.003 lbs/day, which is substantially lower than the permitted limit of 0.021 lbs/day.

Table B – Compliance Evaluation for SVE Restart Data for 2/23/12

Sample Location	TPHg Concentration (ppmv)	Benzene Mass Removal/Emissions (lbs/day)	Flow Rate (scfm)	Temp (°F)*
Influent	860	0.32	131	850
Effluent	7.9	<0.003	131	888
Permit Limit	97% Abatement	0.021 lbs/day	410	>600
Pass/Fail	**Pass** (99.1%)	**Pass**	**Pass**	**Pass**

* Thermocouples in oxidizer chamber transmit temperature data to temperature controllers on oxidizer control panel.

FUTURE ACTIVITIES

Pangea plans to operate the SVE system at the site for approximately six to twelve months. To monitor SVE system performance and abatement efficiency, Pangea plans to monitor the influent and effluent regularly with the Horiba OVA and periodically with laboratory analysis for TPHg and BTEX compounds.

CLOSING

If you have any questions or comments, please feel free to contact me at (510) 435-8664 or briddell@pangeaenv.com.

Sincerely,
Pangea Environmental Services

Bob Clark-Riddell, P.E.

ATTACHMENTS

Table 1 – SVE Performance Data

Attachment A – Laboratory Analytical Results

cc: SWRCB Geotracker Database (electronic copy)
ACEH ftp site (electronic copy)

Pangea

Table 1. SVE (DPE) Performance Data - 1230 14th Street, Oakland, CA

Date	Wells	Oxidizer Hr Meter Reading (hours)	Total Time (days)	Interval Time (days)	System Vapor Flow (cfm)	App Vac ("Hg)	Lab Sample ID	Influent TPHg Lab (ppmv)	Influent Benzene Lab Data (ppmv)	Influent OVA Reading (ppmv)	Air Sparge (status)	SVE TPHg Removal Rate (lbs/day)	SVE Benzene Removal Rate (lbs/day)	Cumulativ SVE TPH Removal (lbs)	Cumulative SVE Benz Removal (lbs)	Effluent OVA Reading (ppmv)	Abate Effic **OVA** (%)	Effluent TPHg Lab (ppmv)	Effluent Benzene Lab (ppmv)	**TPHg** Abate Effic (%)	Benzene Abate Effic (%)	Benzene Emission Rate (lbs/day)	Cumulative Vapor Flow (cf)	Notes
04/27/11	DP-1,2,4,5	10730.2	0.0	0.0	107	9	---	32	2.0	34	Off	1.1	0.06	0.0	0	6	**82.4**	---	---	---	---	---	0	**STARTUP TEST**
05/05/11	DP-1,2,4,5	10895.3	6.9	6.9	107	7	INF-V	**28**	**1.5**	23	Off	1.0	0.05	6.6	0.32	11	**52.2**	**22**	**1.0**	**21.4**	**33.3**	**0.031**	1,059,942	On
05/16/11	DP-1,2,4,5	11164.0	18.1	11.2	107	4	---	20	1.0	---	Off	0.7	0.03	14.3	0.67	---	---	---	---	---	---	---	2,784,996	On
05/24/11	DP-1,2,4,5	11239.0	21.2	3.1	107	4	---	20	1.0	12	Off	0.7	0.03	16.4	0.77	4	**66.7**	---	---	---	---	---	3,266,496	On. **Shutdown** due to high EFF-V conc in lab report.
07/13/11	DP-1,2,4,5	11241.4	21.3	0.1	107	7	---	20	1.0	31	Off	0.7	0.03	16.5	0.77	15	**51.6**	---	---	---	---	---	3,281,904	**TESTING.** Off. Restart, **check cat cell, send for repair**.
09/06/11	DP-1,2,4,5	11250.6	21.7	0.4	55	5	---	400	10.0	451	Test	7.1	0.16	19.2	0.83	336	**25.5**	---	---	---	---	---	3,312,385	Off. Test with air sparging and HVOCs. Off at departure.
10/24/11	DP-1,2,4,5	11251.7	21.7	0.0	79	7	---	1,800	20.0	1906	Test	45.8	0.46	21.3	0.85	905	**52.5**	---	---	---	---	---	3,317,621	Off. Test new cat cell. Heat exchgr issue. Off at departure.
11/23/11	DP-1,2,4,5	11261.3	22.1	0.4	43	5	---	3,500	40.0	3670	Test	47.9	0.50	40.5	1.05	156	**95.7**	---	---	---	---	---	3,342,170	Off. **Install repaired heat exch and repaired cat cell.**
11/28/11	DP-1,2,4,5	11287.4	23.2	1.1	76	8	---	600	13.0	693	Test	14.6	0.29	56.4	1.36	3	**99.6**	---	---	---	---	---	3,461,186	Off. Test for lead in influent with sparging. **Meets permit.**
11/29/11	DP-1,2,4,5	11295.3	23.5	0.3	151	6	---	600	13.0	693	Test	29.1	0.57	66.0	1.55	19	**97.3**	---	---	---	---	---	3,532,760	Off. Restart to test. **Meets permit. Left on for testing.**
12/01/11	DP-1,2,4,5	11342.8	25.5	2.0	68	6	---	500	10.0	548	Test	10.9	0.20	87.5	1.94	16	**97.1**	---	---	---	---	---	3,726,560	On. **Meets permit. Left on for testing.**
12/14/11	DP-1,2,4,5	11653.4	38.5	12.9	64	5	---	200	5.0	203	Test	4.1	0.09	140.7	2.94	11	**94.6**	---	---	---	---	---	4,919,264	On. **<97% dest so turn off.** Test another unit 12/21/11: similar.
01/05/12	DP-1,2,4,5	11659.2	38.7	0.2	93	6	---	600	13.0	695	Test	17.8	0.35	145.0	6.56	56	**91.9**	---	---	---	---	---	4,951,485	Off. Test with dilution air for oxygen. Off at departure.
01/23/12	DP-1,2,4,5	11659.8	38.7	0.0	93	9	---	700	13.0	726	Test	20.9	0.35	145.5	3.04	58	**92.0**	---	---	---	---	---	4,954,842	Off. Restart to test with dilution and prep for lab test.
01/24/12	DP-1,2,4,5	11680.0	39.6	0.8	95	8	INF-V	**1,500**	**24.0**	2290	Test	45.5	0.66	183.8	7.13	230	**90.0**	**180**	**2.8**	**88.0**	**88.3**	**0.077**	5,069,522	On. Collect lab. Off at departure.
02/08/12	DP-1,2,4,5	11683.0	39.7	0.1	95	8	---	1,500	24.0	---	Test	45.5	0.66	189.5	3.67	---	---	---	---	---	---	---	5,086,553	Cat Cell Testing
02/15/12	DP-1,2,4,5	11690.0	40.0	0.3	118	5	INF-V	**180**	**2.1**	156	Off	6.8	0.07	191.5	7.16	10	**93.6**	**7.0**	**0.077**	**96.1**	**96.3**	**0.003**	5,136,113	**RESTART TEST. Test dest. eff. w/new cat cell.**
02/23/12	DP-1,2,4,5	11705.0	40.6	0.6	131	11	INF-V	**860**	**8.5**	749	On	36.1	0.32	214.1	3.97	6	**99.2**	**7.9**	**0.077**	**99.1**	**99.1**	**0.003**	5,254,013	**Restart DPE/AS and Test. AS unit repair: capacitors.**
02/27/12	DP-1,2,4,5	11741.0	42.1	1.5	131	5	INF-V	**73**	**0.8**	---	On	3.1	0.03	218.7	7.23	---	---	---	---	---	---	---	5,536,973	Off. High Enclosure Temp. Restart.
02/28/12	DP-1,2,4,5	11765.6	43.1	1.0	188	5	---	130	5.0	142	On	7.9	0.27	226.8	4.66	---	---	---	---	---	---	---	5,815,052	On. **Limit AS to wells AS-2, AS-4**. Monitor vac influence.
02/29/12	DP-1,2,4,5	11777.0	43.6	0.5	188	5	---	130	5.0	---	Off	7.9	0.27	230.5	7.64	---	---	---	---	---	---	---	5,943,917	Off. Restaft DPE/AS
03/01/12	DP-1,2,4,5	11800.7	44.6	1.0	141	8	INF-V	**450**	**7.7**	350	On	20.4	0.32	250.6	5.13	3	**99.1**	---	---	---	---	---	6,144,419	On. Increased vacuum to 8" Hg.
03/02/12	DP-1,2,4,5	11825.7	45.6	1.0	132	10	---	400	7.7	422	On	16.9	0.30	268.2	8.24	---	---	---	---	---	---	---	6,342,419	On.
03/04/12	DP-1,2,4,5	11880.0	47.9	2.3	132	9	---	400	7.7	422	On	16.9	0.30	306.6	6.10	---	---	---	---	---	---	---	6,772,475	On.

Notes:
ALL = Wells DP-1, DP-2, DP-3, DP-4 and DP-5.
NA = not analyzed; NM = not measured; --- = not available
System data estimated when specific data not available.
cfm = actual cubic feet (cf) per minute based on anemometer readings (from vacuum side of vacuum pump during SVE).
ppmv = parts per million on volume to volume basis. Actual lab data shown in **bold.** Lab data estimated for dates without lab data to allow mass removal calculation.
lbs = Pounds
"Hg = Inches of mercury vacuum
SVE = Soil Vapor Extraction
OVA = Organic Vapor Analyzer (Horiba Model MEXA 324JU)
TPHg and Benzene Removal Rates = For dates where no laboratory analytical data was collected, the lab data is estimated based on prior lab data and OVA readings to calculate period and cumulative mass removal.
Hydrocarbon Removal/Emission Rate = Rate based on Bay Area Air Quality Management District's Manual of Procedures for Soil Vapor Extraction dated July 17, 1991.
Rate = lab concentration (ppmv) x system flowrate (scfm) x (1lb-mole/386 ft³) x molecular weight (86 lb/lb-mole for TPH-Gas hexane) x 1440 min/day x 1/1,000,000.

ATTACHMENT A

Laboratory Analytical Results

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Analytical Report

Pangea Environmental Svcs., Inc. 1710 Franklin Street, Ste. 200 Oakland, CA 94612	Client Project ID: #1150.001; 1230 14th St	Date Sampled: 02/15/12
		Date Received: 02/16/12
	Client Contact: Morgan Gillies	Date Reported: 02/22/12
	Client P.O.:	Date Completed: 02/22/12

WorkOrder: 1202512

February 22, 2012

Dear Morgan:

Enclosed within are:

1) The results of the **2** analyzed samples from your project: **#1150.001; 1230 14th St,**
2) QC data for the above samples, and
3) A copy of the chain of custody.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions or concerns, please feel free to give me a call. Thank you for choosing McCampbell Analytical Laboratories for your analytical needs.

Best regards,

Angela Rydelius
Laboratory Manager
McCampbell Analytical, Inc.

The analytical results relate only to the items tested.

1202512

McCAMPBELL ANALYTICAL, INC.

1534 Willow Pass Road
Pittsburg, CA 94565
Website: www.mccampbell.com Email: main@mccampbell.com
Telephone: (925) 252-9262 Fax: (925) 252-9269

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAY

EDF Required? Coelt (Normal) No Write On (DW) No

Report To: Morgan Gillies Bill To: Pangea

Company: Pangea Environmental Services, Inc.

1710 Franklin Street, Suite 200, Oakland, CA 94612

E-Mail: mgillies@pangeaenv.com

Tele: (510) 836-3702 Fax: (510) 836-3709

Project #: 1150.001 Project Name: 1230 14th St

Project Location: 1230 14th St., Oakland

Sampler Signature:

SAMPLE ID	LOCATION (Field Point Name)	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED ICE	METHOD PRESERVED HCL	METHOD PRESERVED HNO_3	METHOD PRESERVED Other	Analysis Request: BTEX & TPH as Gas (602/8020 + 8015)/MTBE	Analysis Request: 5 Oxygenates (8260)	Other	Comments
INF-V	INF	2/15	1715	1	T			X							X			
EFF-V	EFF	2/15	1710	1	T			X							X			

Filter Samples for Metals analysis: Yes / No

Relinquished By:	Date:	Time:	Received By:
	2/16	1700	
Relinquished By:	Date:	Time:	Received By:
	2/16	1859	
Relinquished By:	Date:	Time:	Received By:

ICE/t° _____ COMMENTS:
GOOD CONDITION _____
HEAD SPACE ABSENT _____
DECHLORINATED IN LAB _____
APPROPRIATE CONTAINERS _____
PRESERVED IN LAB _____

VOAS O&G METALS OTHER
PRESERVATION _____ pH<2 _____

McCampbell Analytical, Inc.
1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 1202512 **ClientCode: PEO**

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☐ Fax ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

Report to:
Morgan Gillies
Pangea Environmental Svcs., Inc.
1710 Franklin Street, Ste. 200
Oakland, CA 94612
(510) 836-3700 FAX: (510) 836-3709

Email: mgillies@pangeaenv.com
cc:
PO:
ProjectNo: #1150.001; 1230 14th St

Bill to:
Bob Clark-Riddell
Pangea Environmental Svcs., Inc.
1710 Franklin Street, Ste. 200
Oakland, CA 94612

Requested TAT: 5 days

Date Received: **02/16/2012**
Date Printed: **02/16/2012**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
1202512-001	INF-V	Air	2/15/2012 17:15	☐	A											
1202512-002	EFF-V	Air	2/15/2012 17:10	☐	A											

Test Legend:

1	G-MBTEX_AIR	2		3		4		5	
6		7		8		9		10	
11		12							

The following SampIDs: 001A, 002A contain testgroup.

Prepared by: Ana Venegas

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

McCampbell Analytical, Inc.
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http://www.mccampbell.com / E-mail: main@mccampbell.com

Sample Receipt Checklist

Client Name: **Pangea Environmental Svcs., Inc.**

Date and Time Received: **2/16/2012 6:58:09 PM**

Project Name: **#1150.001; 1230 14th St**

Checklist completed and reviewed by: Ana Venegas

WorkOrder N°: **1202512** Matrix: Air

Carrier: Benjamin Yslas (MAI Courier)

Chain of Custody (COC) Information

Chain of custody present?	Yes ☑	No ☐
Chain of custody signed when relinquished and received?	Yes ☑	No ☐
Chain of custody agrees with sample labels?	Yes ☑	No ☐
Sample IDs noted by Client on COC?	Yes ☑	No ☐
Date and Time of collection noted by Client on COC?	Yes ☑	No ☐
Sampler's name noted on COC?	Yes ☐	No ☑

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	NA ☑
Shipping container/cooler in good condition?	Yes ☑	No ☐	
Samples in proper containers/bottles?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature	Cooler Temp:		NA ☑
Water - VOA vials have zero headspace / no bubbles?	Yes ☐	No ☐	No VOA vials submitted ☑
Sample labels checked for correct preservation?	Yes ☑	No ☐	
Metal - pH acceptable upon receipt (pH<2)?	Yes ☐	No ☐	NA ☑
Samples Received on Ice?	Yes ☐	No ☑	

** NOTE: If the "No" box is checked, see comments below.*

Comments:

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Pangea Environmental Svcs., Inc.	Client Project ID: #1150.001; 1230 14th St	Date Sampled: 02/15/12
		Date Received: 02/16/12
1710 Franklin Street, Ste. 200	Client Contact: Morgan Gillies	Date Extracted: 02/17/12
Oakland, CA 94612	Client P.O.:	Date Analyzed: 02/17/12

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B Analytical methods: SW8021B/8015Bm Work Order: 1202512

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS	Comments
001A	INF-V	A	660	---	7.0	5.5	0.68	3.2	2	118	d1
002A	EFF-V	A	ND	---	ND	0.26	ND	0.65	1	105	

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	A	25	2.5	0.25	0.25	0.25	0.25	µg/L
	S	1.0	0.05	0.005	0.005	0.005	0.005	mg/Kg

* water and vapor samples are reported in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor

The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation:
d1) weakly modified or unmodified gasoline is significant

DHS ELAP Certification 1644

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.
"When Quality Counts"

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Pangea Environmental Svcs., Inc.	Client Project ID: #1150.001; 1230 14th St	Date Sampled: 02/15/12
		Date Received: 02/16/12
1710 Franklin Street, Ste. 200	Client Contact: Morgan Gillies	Date Extracted: 02/17/12
Oakland, CA 94612	Client P.O.:	Date Analyzed: 02/17/12

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with MTBE and BTEX in ppmv*

Extraction method: SW5030B Analytical methods: SW8021B/8015Bm Work Order: 1202512

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS	Comments
001A	INF-V	A	180	---	2.1	1.4	0.15	0.72	2	118	d1
002A	EFF-V	A	ND	---	ND	0.067	ND	0.15	1	105	

ppm (mg/L) to ppmv (ul/L) conversion for TPH(g) assumes the molecular weight of gasoline to be equal to that of hexane.

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	A	7.0	0.68	0.077	0.065	0.057	0.057	1	uL/L
	S	NA	NA	NA	NA	NA	NA	1	mg/Kg

* vapor samples are reported in µL/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L, water samples and all TCLP & SPLP extracts are reported in µg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor

The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation:
d1) weakly modified or unmodified gasoline is significant

DHS ELAP Certification 1644

Angela Rydelius, Lab Manager

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"When Quality Counts"

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QC SUMMARY REPORT FOR SW8021B/8015Bm

W.O. Sample Matrix: Air | QC Matrix: Water | BatchID: 64935 | WorkOrder: 1202512

EPA Method: SW8021B/8015Bm **Extraction: SW5030B** **Spiked Sample ID: 1202451-006A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	Acceptance Criteria (%)		
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	MS / MSD	RPD	LCS
TPH(btex)£	ND	60	115	107	7.63	112	70 - 130	20	70 - 130
MTBE	ND	10	102	103	0.753	101	70 - 130	20	70 - 130
Benzene	ND	10	104	100	4.35	98.9	70 - 130	20	70 - 130
Toluene	ND	10	103	98.1	4.59	96.7	70 - 130	20	70 - 130
Ethylbenzene	ND	10	103	98.4	4.74	97.3	70 - 130	20	70 - 130
Xylenes	ND	30	104	98.7	5.43	98	70 - 130	20	70 - 130
%SS:	104	10	99	102	2.22	98	70 - 130	20	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

BATCH 64935 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1202512-001A	02/15/12 5:15 PM	02/17/12	02/17/12 3:05 PM	1202512-001A	02/15/12 5:15 PM	02/17/12	02/17/12 3:05 PM
1202512-002A	02/15/12 5:10 PM	02/17/12	02/17/12 2:36 PM	1202512-002A	02/15/12 5:10 PM	02/17/12	02/17/12 2:36 PM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

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QA/QC Officer

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Analytical Report

Pangea Environmental Svcs., Inc. 1710 Franklin Street, Ste. 200 Oakland, CA 94612	Client Project ID: #1150.001; 1230 14th St	Date Sampled: 02/23/12
		Date Received: 02/23/12
	Client Contact: Morgan Gillies	Date Reported: 02/29/12
	Client P.O.:	Date Completed: 02/27/12

WorkOrder: 1202686

February 29, 2012

Dear Morgan:

Enclosed within are:

1) The results of the **2** analyzed samples from your project: **#1150.001; 1230 14th St,**
2) QC data for the above samples, and
3) A copy of the chain of custody.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions or concerns, please feel free to give me a call. Thank you for choosing McCampbell Analytical Laboratories for your analytical needs.

Best regards,

Angela Rydelius
Laboratory Manager
McCampbell Analytical, Inc.

The analytical results relate only to the items tested.

McCAMPBELL ANALYTICAL, INC.

1534 Willow Pass Road
Pittsburg, CA 94565
Website: www.mccampbell.com Email: main@mccampbell.com
Telephone: (925) 252-9262 Fax: (925) 252-9269

CHAIN OF CUSTODY RECORD

120686

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☒ 5 DAY

EDF Required? Coelt (Normal) No Write On (DW) No

Report To: Morgan Gillies	Bill To: Pangea
Company: Pangea Environmental Services, Inc.	
1710 Franklin Street, Suite 200, Oakland, CA 94612	
	E-Mail: mgillies@pangeaenv.com
Tele: (510) 836-3702	Fax: (510) 836-3709
Project #: 1150.001	Project Name: 1230 14th St
Project Location: 1230 14th St., Oakland	
Sampler Signature:	

SAMPLE ID	LOCATION (Field Point Name)	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED ICE	METHOD PRESERVED HCL	METHOD PRESERVED HNO_3	METHOD PRESERVED Other	Analysis Request: BTEX & TPH as Gas (602/8020 + 8015)/MTBE	Analysis Request: 5 Oxygenates (8260)	Other	Comments
INF-V		2/23	1230	1	T			X							X			
EFF-V		2/23	1225	1	T			X							X			

Filter Samples for Metals analysis: Yes / No

Relinquished By:	Date: 2/23/12	Time: 1429	Received By:
Relinquished By:	Date: 2/23/12	Time: 1515	Received By:
Relinquished By:	Date:	Time:	Received By:

ICE/t° n/a
GOOD CONDITION____
HEAD SPACE ABSENT____
DECHLORINATED IN LAB____
APPROPRIATE CONTAINERS____
PRESERVED IN LAB____

COMMENTS:

	VOAS	O&G	METALS	OTHER
PRESERVATION			pH<2	

McCampbell Analytical, Inc.
1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 1202686 **ClientCode: PEO**

☐ WaterTrax ☐ WriteOn ☑ EDF ☐ Excel ☐ Fax ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

Report to:
Morgan Gillies
Pangea Environmental Svcs., Inc.
1710 Franklin Street, Ste. 200
Oakland, CA 94612
(510) 836-3700 FAX: (510) 836-3709

Email: mgillies@pangeaenv.com
cc:
PO:
ProjectNo: #1150.001; 1230 14th St

Bill to:
Bob Clark-Riddell
Pangea Environmental Svcs., Inc.
1710 Franklin Street, Ste. 200
Oakland, CA 94612

Requested TAT: **5 days**

Date Received: **02/23/2012**
Date Printed: **02/24/2012**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
1202686-001	INF-V	Air	2/23/2012 12:30	☐	A	A										
1202686-002	EFF-V	Air	2/23/2012 12:25	☐	A											

Test Legend:

1	G-MBTEX_AIR	2	PREDF REPORT	3		4		5	
6		7		8		9		10	
11		12							

The following SampIDs: 001A, 002A contain testgroup.

Prepared by: Zoraida Cortez

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

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Sample Receipt Checklist

Client Name: **Pangea Environmental Svcs., Inc.**

Date and Time Received: **2/23/2012 7:35:01 PM**

Project Name: **#1150.001; 1230 14th St**

Checklist completed and reviewed by: Zoraida Cortez

WorkOrder N°: **1202686** Matrix: Air

Carrier: Rob Pringle (MAI Courier)

Chain of Custody (COC) Information

Chain of custody present?	Yes ☑	No ☐
Chain of custody signed when relinquished and received?	Yes ☑	No ☐
Chain of custody agrees with sample labels?	Yes ☑	No ☐
Sample IDs noted by Client on COC?	Yes ☑	No ☐
Date and Time of collection noted by Client on COC?	Yes ☑	No ☐
Sampler's name noted on COC?	Yes ☑	No ☐

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	NA ☑
Shipping container/cooler in good condition?	Yes ☑	No ☐	
Samples in proper containers/bottles?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature	Cooler Temp:		NA ☑
Water - VOA vials have zero headspace / no bubbles?	Yes ☐	No ☐	No VOA vials submitted ☑
Sample labels checked for correct preservation?	Yes ☑	No ☐	
Metal - pH acceptable upon receipt (pH<2)?	Yes ☐	No ☐	NA ☑
Samples Received on Ice?	Yes ☐	No ☑	

** NOTE: If the "No" box is checked, see comments below.*

Comments:

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Pangea Environmental Svcs., Inc.	Client Project ID: #1150.001; 1230 14th St	Date Sampled: 02/23/12
		Date Received: 02/23/12
1710 Franklin Street, Ste. 200	Client Contact: Morgan Gillies	Date Extracted: 02/24/12
Oakland, CA 94612	Client P.O.:	Date Analyzed: 02/24/12

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B Analytical methods: SW8021B/8015Bm Work Order: 1202686

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS	Comments
001A	INF-V	A	3100	ND<35	27	28	3.1	16	2	103	d1
002A	EFF-V	A	28	ND	ND	0.36	ND	0.34	1	114	d1

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	A	25	2.5	0.25	0.25	0.25	0.25	µg/L
	S	1.0	0.05	0.005	0.005	0.005	0.005	mg/Kg

* water and vapor samples are reported in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor

The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation:
d1) weakly modified or unmodified gasoline is significant

DHS ELAP Certification 1644

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.
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Pangea Environmental Svcs., Inc.	Client Project ID: #1150.001; 1230 14th St	Date Sampled: 02/23/12
		Date Received: 02/23/12
1710 Franklin Street, Ste. 200	Client Contact: Morgan Gillies	Date Extracted: 02/24/12
Oakland, CA 94612	Client P.O.:	Date Analyzed: 02/24/12

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with MTBE and BTEX in ppmv*

Extraction method: SW5030B Analytical methods: SW8021B/8015Bm Work Order: 1202686

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS	Comments
001A	INF-V	A	860	ND<10	8.5	7.3	0.71	3.7	2	103	d1
002A	EFF-V	A	7.9	ND	ND	0.094	ND	0.076	1	114	d1

ppm (mg/L) to ppmv (ul/L) conversion for TPH(g) assumes the molecular weight of gasoline to be equal to that of hexane.

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	A	7.0	0.68	0.077	0.065	0.057	0.057	1	uL/L
	S	NA	NA	NA	NA	NA	NA	1	mg/Kg

* vapor samples are reported in µL/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L, water samples and all TCLP & SPLP extracts are reported in µg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor

The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation:
d1) weakly modified or unmodified gasoline is significant

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Angela Rydelius, Lab Manager

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QC SUMMARY REPORT FOR SW8021B/8015Bm

W.O. Sample Matrix: Air | QC Matrix: Water | BatchID: 65189 | WorkOrder: 1202686

EPA Method: SW8021B/8015Bm **Extraction: SW5030B** **Spiked Sample ID: 1202671-011B**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	Acceptance Criteria (%)		
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	MS / MSD	RPD	LCS
TPH(btex)£	ND	60	105	116	9.33	116	70 - 130	20	70 - 130
MTBE	ND	10	98	101	3.51	113	70 - 130	20	70 - 130
Benzene	ND	10	99.1	99.5	0.440	111	70 - 130	20	70 - 130
Toluene	ND	10	96	98.2	2.15	109	70 - 130	20	70 - 130
Ethylbenzene	ND	10	97.4	100	2.92	109	70 - 130	20	70 - 130
Xylenes	ND	30	97.5	99.9	2.44	109	70 - 130	20	70 - 130
%SS:	101	10	99	97	1.67	105	70 - 130	20	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

BATCH 65189 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1202686-001A	02/23/12 12:30 PM	02/24/12	02/24/12 11:48 PM	1202686-002A	02/23/12 12:25 PM	02/24/12	02/24/12 4:24 PM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS ELAP Certification 1644

QA/QC Officer