Hooshang Hadjian
2108 San Ramon Valley Blvd.
San Ramon, CA 94583

Mr. Paresh Khatri
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Dublin Auto Wash
7240 Dublin Boulevard
Dublin, California
ACHCSA Case No. 304

Dear Mr.Chan:

I, Mr. Hooshang Hadjian, have retained Pangea Environmental Services, Inc. (Pangea) as the 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 is true and correct to the best of my knowledge.

Sincerely,

Hooshang Hadjian

September 27, 2010

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

Re: **SVE System Startup Results**
Portable Soil Vapor Extraction (SVE) System
7240 Dublin Blvd, Dublin, California
Pangea Project # 1001.001
BAAQMD Plant No. 16254
BAAQMD Application No. 10330

Dear Ms. Chan:

On behalf of Mako Industries (permit holder), Pangea Environmental Services (Pangea) is submitting the startup test results for the portable soil vapor extraction (SVE) system in operation at the subject site. The Bay Area Air Quality Management District (BAAQMD) issued a Permit-To-Operate (PTO) to Mako Industries for a *portable* SVE system as Plant # 16254. Startup testing was initiated on September 15, 2010 and continuous operation began on September 20, 2010. Described below are the system description, system startup and sampling, permit compliance, and future activities.

SYSTEM DESCRIPTION

The SVE system consists of a 400 cubic foot per minute (cfm) liquid-ring blower (S-1), thermal/ 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 is simultaneously extracted from the subsurface using PVC piping and drop-tube stingers in up to seven remediation wells. After extraction from the wells, the soil vapor/water stream passes through a 120-gallon vapor/liquid separator, where any entrained groundwater is separated out and treated. From the vapor/liquid separator, soil vapor passes through the liquid-ring blower and into the thermal/catalytic oxidizer before being discharged to the atmosphere. The unit is currently operating in thermal oxidizer mode (without the catalytic module).

SYSTEM STARTUP AND SAMPLING

Pangea provided startup notification to Flora Chan on September 14, 2010, who authorized startup testing on September 15, 2010. Due to equipment issues, the SVE system did not commence continuous operation at the site until Monday morning, September 20, 2010. Influent and effluent vapor samples were collected on Monday afternoon, after approximately 11 hours of total operation

at the site. 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 Table A. Given the influent vapor concentration of 810 ppmv TPHg (between 200 and 2,000 ppmv), the Permit-To-Operate (PTO) requires a minimum abatement/destruction efficiency of >97% for TPHg and benzene. Based on the startup data the equipment achieved abatement of >99.1% for TPHg and >99.3% for benzene, which exceeds the permit requirement. The PTO also requires a maximum flow rate of 400 scfm and minimum oxidizer temperature of 1,400 degrees Fahrenheit. The equipment operated in compliance with these additional requirements.

Table A – Compliance Evaluation for SVE Startup Data for 9/20/10

Sample Location	TPHg Concentration (ppmv)	Benzene Concentration (ppmv)	Flow Rate (scfm)	Temp (°F)*
Influent	810	11	62	1450
Effluent	<7.0	<0.077	62	1450
Permit Limit	97% Abatement	97% Abatement	400	>1400
Pass/Fail	**Pass** (>99.1%)	**Pass** (>99.3%)	**Pass**	**Pass**

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

As shown on attached Table 1, the estimated benzene emission rate was < 0.001 lbs/day, substantially below the permit limit of 0.250 lbs/day. The TPHg and benzene removal rates from the subsurface were approximately 19.2 and 0.24 lbs/day, respectively.

PLANNED FUTURE ACTIVITIES

Pangea plans to operate the portable SVE system at the site for approximately one to three months. and monitor the system on a daily basis. To monitor SVE system performance and abatement efficiency, Pangea plans to analyze influent and effluent samples for TPHg and BTEX compounds on a weekly or reduced basis.

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)
cc: Rob Larsen, Mako Industries (electronic copy)

Pangea

Table 1. SVE (DPE) Performance Data - 7240 Dublin Blvd, Dublin, CA

Date	Wells	Oxidizer Hr Meter Reading (hours)	Total Time (days)	Interval Time (days)	System Vapor Flow Rate (cfm)	Applied Vacuum ("Hg)	Lab Sample ID	Influent TPHg Lab Data (ppmv)	Influent Benzene Lab Data (ppmv)	Influent OVA Reading (ppmv)	Removal: SVE TPHg Removal Rate (lbs/day)	Removal: SVE Benzene Removal Rate (lbs/day)	Removal: Cumulative SVE TPHg Removal (lbs)	Removal: Cumulative SVE Benzene Removal (lbs)	Emission Reporting: Effluent TPHg Lab (ppmv)	Effluent Benzene Lab Data (ppmv)	TPHg Abatement Efficiency (lbs/day)	Benzene Abatement Efficiency (lbs/day)	Benzene Emission Rate (lbs/day)	Cumulative Benzene Emission (lbs)	Cumulative Vapor Flow (cf)
09/15/10	All	1079.8	0.00	0.00	63	15	---	700	10	504	14.1	0.18	0.0	0	---	< 0.077	---	---	< 0.001	< 0.000	0
09/16/10	MW-3A,6A,7AA+VW-3	1082.7	0.12	0.12	65	21	---	800	10	596	16.7	0.19	2.0	0.02	---	< 0.077	---	---	< 0.001	< 0.000	11,310
09/17/10	MW-3A,6A,7AA+VW-3	1086.0	0.26	0.14	65	21	---	800	10	596	16.7	0.19	4.3	0.05	---	< 0.077	---	---	< 0.001	< 0.000	24,180
09/20/10	MW-3A,6A,7AA+VW-3	1090.8	0.46	0.20	62	22	Influent	**810**	**11**	586	16.1	0.20	7.5	0.09	< **7.0**	< **0.077**	> **99.1**	> **99.3**	< 0.001	< 0.001	42,036

Notes:
ALL = Wells DPE-1, DPE-2, MW-3A, MW-6A, MW-7AA, MW-7A and VW-3
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 near wellhead and/or from pressure 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 previous lab data entry was used 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
Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

Pangea Environmental Svcs., Inc.	Client Project ID: #7240 Dublin Blvd	Date Sampled: 09/20/10
		Date Received: 09/20/10
1710 Franklin Street, Ste. 200	Client Contact: Tina De La Fuente	Date Reported: 09/23/10
Oakland, CA 94612	Client P.O.:	Date Completed: 09/21/10

WorkOrder: 1009520

September 23, 2010

Dear Tina:

Enclosed within are:

1) The results of the **2** analyzed samples from your project: **#7240 Dublin Blvd,**
2) A QC report for the above samples,
3) A copy of the chain of custody, and
4) An invoice for analytical services.

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.

1009520

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: Tina de la Fuente Bill To: Pangea
Company: Pangea Environmental Services, Inc.
1710 Franklin Street, Suite 200, Oakland, CA 94612
E-Mail: tdelafuente@pangeaenv.com
Tele: (510) 836-3702 Fax: (510) 836-3709
Project #: 7240 Dublin Blvd Project Name: 7240 Dublin Blvd
Project Location: 7240 Dublin Blvd., Dublin, CA
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	BTEX & TPH as Gas (602/8020 + 8015)/MTBE	TPH as Diesel (8015) w/ Silica Gel Cleanup	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010 / 8021	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8081	EPA 608 / 8082 PCB's ONLY	EPA 8140 / 8141	EPA 8150 / 8151	EPA 524.2 / 624 / 8260	EPA 525 / 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals (6010 / 6020)	LUFT 5 Metals (6010 / 6020)	Lead (200.8 / 200.9 / 6010)	Other	Other	Other	Comments
INF	INF	9/20/10	12:32	1	TEDLAR BAG			X							X																			Filter Samples for Metals analysis: Yes / No
EFF	EFF	9/20/10	12:30	1	↓			X							X																			

Relinquished By:	Date:	Time:	Received By:
	9/20	13:42	ENVIRO-TECH SERVICES AA
ENVIRO-TECH SERVICES AA	9/20/10	15:30	
	9/20/10	1630	

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: 1009520 **ClientCode: PEO**

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

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

Email: tdelafuente@pangeaenv.com
cc:
PO:
ProjectNo: #7240 Dublin Blvd

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

Requested TAT: 5 days

Date Received: **09/20/2010**
Date Printed: **09/20/2010**

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
1009520-001	INF	Air	9/20/2010 12:32	☐	A	A										
1009520-002	EFF	Air	9/20/2010 12:30	☐	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: 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.

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"When Quality Counts"

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Telephone: 877-252-9262 Fax: 925-252-9269

Sample Receipt Checklist

Client Name: **Pangea Environmental Svcs., Inc.**
Date and Time Received: **9/20/2010 4:55:51 PM**

Project Name: **#7240 Dublin Blvd**
Checklist completed and reviewed by: Ana Venegas

WorkOrder N°: **1009520** 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.*

Client contacted: Date contacted: Contacted by:

Comments:

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Telephone: 877-252-9262 Fax: 925-252-9269

Pangea Environmental Svcs., Inc.	Client Project ID: #7240 Dublin Blvd	Date Sampled: 09/20/10
		Date Received: 09/20/10
1710 Franklin Street, Ste. 200	Client Contact: Tina De La Fuente	Date Extracted: 09/20/10
Oakland, CA 94612	Client P.O.:	Date Analyzed: 09/20/10

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

Extraction method: SW5030B Analytical methods: SW8021B/8015Bm Work Order: 1009520

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS	Comments
001A	INF	A	2900	ND<250	35	21	38	150	4	114	d1
002A	EFF	A	ND	ND	ND	ND	ND	ND	1	100	

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: #7240 Dublin Blvd	Date Sampled: 09/20/10
		Date Received: 09/20/10
1710 Franklin Street, Ste. 200	Client Contact: Tina De La Fuente	Date Extracted: 09/20/10
Oakland, CA 94612	Client P.O.:	Date Analyzed: 09/20/10

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

Extraction method: SW5030B Analytical methods: SW8021B/8015Bm Work Order: 1009520

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS	Comments
001A	INF	A	810	ND<60	11	5.5	8.7	34	4	114	d1
002A	EFF	A	ND	ND	ND	ND	ND	ND	1	100	

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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QC SUMMARY REPORT FOR SW8021B/8015Bm

W.O. Sample Matrix: Air QC Matrix: Water BatchID: 53219 WorkOrder 1009520

EPA Method SW8021B/8015Bm **Extraction SW5030B** **Spiked Sample ID: 1009527-003A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
TPH(btex)£	ND	60	88.5	88.8	0.307	94.8	85.5	10.4	70 - 130	20	70 - 130	20
MTBE	ND	10	109	113	3.67	111	115	3.78	70 - 130	20	70 - 130	20
Benzene	ND	10	103	103	0	101	105	3.70	70 - 130	20	70 - 130	20
Toluene	ND	10	92.2	92.4	0.198	92.5	94.3	1.86	70 - 130	20	70 - 130	20
Ethylbenzene	ND	10	91	91.1	0.0964	88.9	93.1	4.53	70 - 130	20	70 - 130	20
Xylenes	ND	30	103	102	0.559	101	104	2.99	70 - 130	20	70 - 130	20
%SS:	106	10	102	101	0.308	106	105	0.213	70 - 130	20	70 - 130	20

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

BATCH 53219 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1009520-001A	09/20/10 12:32 PM	09/20/10	09/20/10 10:52 PM	1009520-002A	09/20/10 12:30 PM	09/20/10	09/20/10 11:22 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