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Mr. Paul Cho
Regional Water Quality Control Board
Los Angeles Region
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April 19, 2016

Subject: Horizontal Pilot Testing Project – Results of January and February 2016 Soil Vapor Monitoring at the South-Central Area of the SFPP Norwalk Pump Station, Norwalk, California

Dear Mr. Cho,

This letter report presents the results of the soil vapor monitoring conducted in January and February 2016 at the SFPP Norwalk Pump Station, located at 15306 Norwalk Boulevard, Norwalk, California (the site; Figure 1). The soil vapor work was performed by CH2M HILL Engineers, Inc. (CH2M), on behalf of SFPP, L.P. (SFPP), as part of the pilot testing program for SFPP's horizontal biosparge system. Groundwater monitoring data collected as part of the pilot testing will be provided under separate cover in a comprehensive evaluation report that will be prepared after additional data are collected. Both soil vapor and groundwater monitoring are conducted in general accordance with the approved *Horizontal Biosparge System Construction and Pilot Test Work Plan* (CH2M, 2013). The project background, purpose, approach, and results of the soil vapor monitoring are presented below, followed by a summary and recommendations.

Background

SFPP recently completed installation of a horizontal biosparge system to enhance mass removal of hydrocarbon constituents beneath the south-central area of the site. Construction of the biosparge well is documented in the report titled, "*Horizontal Biosparge Well and Soil Vapor Monitoring Probe Completion Report SFPP Norwalk Pump Station, 15306 Norwalk Boulevard, Norwalk, California*" (CH2M, 2015). Pilot testing of the system was initiated on January 6, 2016. Pilot testing is anticipated to continue for approximately 1 year in order to evaluate the feasibility of system expansion.

Ambient air was injected into the biosparge well, via a rotary screw air compressor, at increasing flow rates over several weeks until the maximum design rate of approximately 500 standard cubic feet per minute (scfm)was achieved. SFPP's soil vapor extraction (SVE) system has an interlock which ensures that biosparging cannot occur unless the SVE system is operating. Operation of the SVE system reduces the potential for offgassing of volatile organic compounds (VOCs) during biosparge operations. During air injection, onsite and offsite soil vapor monitoring probes were monitored weekly using a photoionization detector (PID) and monthly using a mobile laboratory.

Purpose

The purpose of the soil vapor monitoring is to ensure that shallow subsurface vapors do not pose an unacceptable human health risk to residents in the offsite area south of the site during biosparge system operations.

Approach

CH2M field staff performed weekly PID monitoring of the south-central area soil vapor monitoring network (SVM-1 through SVM-3, SVM-5 through SVM-8, and SVM-10 through SVM-16) during the initial 2 months of biosparge operations. Figure 2 shows the location of soil vapor monitoring probes. Figure 3 shows the completion details of a typical nested probe.

CH2M retained American Analytics of Chatsworth, California, to collect and analyze soil vapor samples from the same probes in January and February 2016. A mobile laboratory was used by American Analytics for onsite laboratory analysis of soil vapor samples. The technical approach and analytical results are discussed below.

Weekly Monitoring

Approximately once per week in January and February 2016, a CH2M field technician collected field VOCs measurements from the south-central area soil vapor probe network using a PID calibrated against hexane. Field readings were collected after each probe was purged approximately three system volumes using a hand-held portable vacuum pump. A vacuum measurement was also collected from each probe using a digital manometer.

Monthly Monitoring with Mobile Laboratory

Monthly soil vapor samples were collected by American Analytics and analyzed onsite using its mobile laboratory under the direction of CH2M. Sampling was conducted from January 27 to January 29, 2016, and February 24 to February 26, 2016. The soil vapor probes at each monitoring location were purged and sampled in accordance with the recommended guidelines in the Department of Toxic Substances Control (DTSC) *Advisory for Active Soil Gas Investigations* (Advisory), dated July 2015 (DTSC, 2015). The analytical results were evaluated by comparison with soil gas screening levels based on the most current DTSC guidance (DTSC, 2015). The soil gas screening levels are calculated from indoor air screening levels published by DTSC in its Human Health Risk Assessment (HHRA) Note 3 (DTSC, 2016) using the default attenuation factors presented in DTSC's vapor intrusion guidance (DTSC, 2011).

Sampling and Analysis

As described above, soil vapor sampling was conducted from probes SVM-1 through SVM-3, SVM-5 through SVM-8, and SVM-10 through SVM-16 in January and February 2016. The soil vapor probes from each monitoring location were purged and sampled using a vacuum/pressure sampling pump calibrated to a flow rate of 200 milliliters per minute in accordance with recommended flow rates in the Advisory (DTSC, 2015).

A soil vapor sample was not collected at the deep probe of SVM-2 and shallow probe of SVM-10 due to flow restrictions (excessive vacuum) observed during purging activities with a mechanical and hand-held sampling pump. Soil vapor samples also were not collected from the shallow or deep probes of SVM-4 due to property access restrictions. The shallow and deep probes of SVM-9 are located in the southeastern area (outside of the pilot testing area) and were therefore not monitored.

Soil vapor samples were collected using 1.4-liter Summa canisters and glass syringes, and were analyzed by the American Analytics onsite mobile laboratory for VOCs using U.S. Environmental Protection

Agency (EPA) Method TO-15. Total petroleum hydrocarbons quantified as gasoline (TPH-g) were analyzed using EPA Method TO-3, and fixed gases (carbon dioxide, methane, and oxygen) were analyzed using EPA Method 3C. Included in the TO-15 list of analytes were benzene, toluene, ethylbenzene, and total xylenes (BTEX); methyl tert-butyl ether (MTBE); naphthalene, tert-butyl alcohol (TBA [also known as tert-butanol]); 1,2-dichloroethane; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; n-butylbenzene; sec-butylbenzene; isopropylbenzene; n-propylbenzene; and 2-propanol (the leak test compound). These constituents were identified as chemicals of potential concern (COPCs) based on the results of the 2006 soil gas investigation and human health risk assessment (Geomatrix, 2006).

In accordance with the Advisory (DTSC, 2015), field duplicate soil vapor samples were collected at a minimum frequency of 1 per every 20 soil vapor samples collected. During the January event, duplicate soil vapor samples were collected at SVM-3 (5-foot depth), SVM-14 (15-foot depth), and SVM-16 (22-foot depth). During the February event, duplicate soil vapor samples were collected at SVM-3 (5-foot depth), SVM-6 (16-foot depth), SVM-14 (15-foot depth), and SVM-16 (22-foot depth). The duplicate samples were collected and analyzed in the same manner as the primary samples.

Ambient air samples were also collected each day of sampling and analyzed by the mobile laboratory for VOCs and TPH-g. The purpose of the ambient air samples is to quantify background concentrations of COPCs near select sampling locations.

Weekly Monitoring Results

Table 1 presents a summary of field VOCs (using a PID) and vacuum measurements collected from the south-central area soil vapor monitoring network on a weekly basis between January 9 and February 26, 2016. Biosparge system flow rates during soil vapor monitoring were progressively increased from approximately 120 to 500 scfm. The SVE system was operational during all monitoring events. The following observations were made:

Offsite Probes

- Shallow probe depths (less than 7 feet below ground surface [bgs]) of offsite soil vapor probes had VOCs concentrations of less than 5 parts per million by volume (ppmv).
- With the exception of SVM-6, VOC concentrations in the 15-foot depths of offsite soil vapor probes were less than 5 ppmv. The deep probe at SVM-6 had a maximum VOC concentration of 520 ppmv on February 12, 2016, but subsequently decreased to 47 ppmv during the February 24 to 26, 2016, sampling event.

Onsite Probes

- Elevated VOC measurements were reported in one or more depths of onsite soil vapor probes SVM-11, SVM-12, SVM-13, and SVM-14. Maximum VOC concentrations were reported in onsite probe SVM-14, at all sample depths. SVM-14 is located less than 10 feet from the horizontal biosparge well; therefore, elevated VOC concentrations at this location were not unexpected.
- Maximum positive pressure (approximately 55 inches of water) was reported at the deepest probe of SVM-14 during the maximum biosparge rate (500 scfm). This was also not unexpected due to its lateral and vertical proximity to the biosparge well.

Mobile Laboratory Results

Table 2 presents the analytical results for samples collected during the January 2016 sampling event. Table 3 presents the results for samples collected in February 2016. Laboratory analytical reports are included in Attachment A. A summary of results is provided below.

January Event

- VOCs and TPH-g were nondetect at all probe depths of offsite probes SVM-1, SVM-2, SVM-6, SVM-7, SVM-10, and SVM-15, and onsite probes SVM-11 and SVM-12.
- Isolated detections of VOCs (chloroform, ethanol, n-hexane, and/or toluene) were reported in offsite probes SVM-3 (15-foot depth), SVM-5 (15-foot depth), and SVM-8 (15-foot depth), at concentrations near the laboratory reporting limit, and below screening levels under residential and commercial scenarios. VOCs and TPH-g were nondetect in the shallow (5-foot) depths of these probes.
- Several VOCs and TPH-g were detected in the deepest probe depth of onsite probe SVM-13. Of these, benzene (3.3 micrograms per liter [μg/L]) and ethylbenzene (13 μg/L) were detected at concentrations above screening levels under residential and commercial scenarios. TPH-g (1,500 μg/L) was detected at a concentration above its residential screening level (630 μg/L) but below its commercial screening level (2,600 μg/L). VOCs and TPH-g were nondetect in the shallow and middle probe depths of SVM-13.
- Several VOCs were detected at all probe depths of onsite probe SVM-14. In the shallow probe depth, TPH-g (890 μg/L) was reported at a concentration above its residential screening level (630 μg/L) but below its commercial screening level (2,600 μg/L). Detected VOCs and TPH-g were below screening levels in the middle probe depth. In the deepest probe depth, benzene (2,200 μg/L), m,p-xylenes (620 μg/L), o-xylenes (200 μg/L), toluene (3,400 μg/L), n-hexane (3,800 μg/L), and TPH-g (57,000 μg/L) were detected at concentrations above their screening levels under residential and/or commercial scenarios.
- Several VOCs were detected at the deepest probe depth of offsite probe SVM-16 but at concentrations below screening levels under residential and commercial scenarios. VOCs were nondetect in the shallow and middle probe depths of SVM-16; TPH-g was nondetect at all probe depths.

February Event

- VOCs and TPH-g were nondetect at all probe depths of offsite probes SVM-1, SVM-2, SVM-3, SVM-5, SVM-7, SVM-8, SVM-10, and SVM-16.
- Several non-COPCs were detected at the 16-foot depth of SVM-6 including 2,2,4-trimethylpentane (6.1 μg/L), cyclohexane (0.46 μg/L), n-hexane (0.43 μg/L) and TPH-g (33 μg/L) but at concentrations below screening levels under residential and commercial scenarios. 2,2,4-trimethylpentane (0.088 μg/L) was the only VOC detected in the shallow depth of SVM-6. There are no established screening levels for 2,2,4-trimethylpentane.
- Cyclohexane was detected in the shallow and middle depths of onsite probe SVM-11 (0.13 μg/L and 0.038 μg/L, respectively) but at concentrations near the reporting limit, and below screening levels under residential and commercial scenarios. VOCs were nondetect in the deepest probe depth of SVM-11; TPH-g was nondetect at all probe depths.
- 2,2,4-trimethylpentane (2 μg/L) and cyclohexane (0.034 μg/L) were detected in the middle depth of onsite probe SVM-12 but at concentrations below residential and commercial screening levels. Several VOCs and TPH-g were detected in the deepest probe depth of SVM-12. Of these, benzene (10 μg/L) and TPH-g (3,300 μg/L) were detected at concentrations above residential and commercial screening levels. All VOCs and TPH-g were nondetect in the shallow probe depth of SVM-12.

- Several non-COPCs including 2,2,4-trimethylpentane (4.7 μg/L), cyclohexane (1.8 μg/L), heptane (0.6 μg/L), n-hexane (3.8 μg/L), and TPH-g (74 μg/L), were detected in the deepest probe depth of onsite probe SVM-13 but at concentrations below screening levels under residential and commercial scenarios. VOCs and TPH-g were nondetect in the shallow and middle depths of SVM-13.
- Several VOCs and TPH-g were detected at all probe depths of onsite SVM-14 at concentrations above screening levels under residential and commercial scenarios. Maximum concentrations were generally detected in the deepest probe depth. At the shallow probe depth, TPH-g was the only constituent detected above its screening level. This TPH-g detection (1,600 μg/L) was above its residential screening level of 630 μg/L but below its commercial screening level of 2,600 μg/L.
- Several VOCs and TPH-g were detected in the deepest probe depth of offsite SVM-15. Of these, benzene (1.7 μg/L) was the only VOC detected at a concentration above screening levels. VOCs and TPH-g were nondetect in the shallow and middle probe depths of SVM-15.

Summary and Recommendations

Soil vapor monitoring was conducted in the south-central area of the SFPP Norwalk Pump Station during biosparging operations in January and February 2016. During this time, biosparge system flow rates were gradually increased to a maximum design rate of approximately 500 scfm. The purpose of the soil vapor monitoring is to ensure that shallow subsurface vapors do not pose an unacceptable human health risk to residents in the offsite area south of the site during biosparge system operations. The SVE remained online during biosparge operations (and soil vapor monitoring) to reduce the potential for offgassing of subsurface VOCs. Monitoring included the collection of weekly VOCs and vacuum measurements using hand-held field equipment (PID, digital manometer) and monthly sampling and analysis of soil vapor samples using an onsite mobile laboratory.

The soil vapor probes monitored were SVM-1 through SVM-3, SVM-5 through SVM-8, and SVM-10 through SVM-16. The deep probe of SVM-2 and shallow probe of SVM-10 were not monitored due to flow restrictions (excessive vacuum) observed during purging activities. The shallow and deep probes of SVM-4 also were not monitored due to property access restrictions. The shallow and deep probes of SVM-9 are located in the southeastern area (outside of the pilot testing area) and were therefore not monitored.

Weekly Monitoring

Weekly monitoring of soil vapor probes using the PID indicate the following:

- Shallow VOCs in the offsite area remained relatively low with increasing biosparge system flow rates. These data indicate there was sufficient capture of shallow soil vapors in the offsite area by the SVE system.
- Elevated VOCs were reported in onsite probes SVM-11, SVM-12, SVM-13, and SVM-14; concentrations were generally higher at the deeper probe depths. Maximum VOCs were reported at SVM-14, which is located in proximity (less than 10 feet) to the biosparge well. Due to its lateral proximity to the biosparge well, it was not unexpected to observe elevated VOCs at SVM-14.

Monthly Monitoring Using Mobile Laboratory

Monthly analytical results from the mobile laboratory were generally consistent with the weekly field PID measurements collected in January and February 2016. During the January sampling event, the biosparge system flow rate was approximately 360 scfm, which is approximately 72 percent of the maximum flow rate that is achievable. The data show the following:

- In the offsite area, VOCs were nondetect in the shallow depths; detections of VOCs in the deeper offsite probes (SVM-3, SVM-5, SVM-8, and SVM-16) were below screening levels under residential and commercial scenarios. TPH-g was nondetect in all offsite probes.
- In the onsite area, VOCs and TPH-g were detected at one or more depths of onsite probes SVM-13 and SVM-14 at concentrations above screening levels under residential and commercial scenarios. Concentrations were generally highest at the deepest (22-foot) probe depths. Depth to water across the site is between 25 and 30 feet bgs, with the hydrocarbon smear zone occurring at average depths of approximately 27 to 31 feet bgs in the south-central area. Therefore, it is not unexpected that soil vapor samples at the 22-foot depth have elevated VOCs at concentrations exceeding screening levels.

During the February sampling event, the biosparge system flow rate was at its maximum of approximately 500 scfm. The data show the following:

- In the offsite area, only one VOC (2,2,4-trimethylbenzene) was detected in the shallow depth of the offsite soil vapor probes. This detection (0.088 μg/L) was reported in probe SVM-6 and was near the laboratory reporting limit. There is no established screening level for 2,2,4-trimethylbenzene. Other VOCs were detected at SVM-6 in the deeper probe depth (16-foot) but at concentrations below screening levels under residential and commercial scenarios. Benzene was the only VOC detected in the offsite probes at a concentration above screening levels. This detection was reported in the deepest (22-foot) depth of SVM-15.
- In the onsite area, several VOCs and TPH-g were detected in probes SVM-11, SVM-12, SVM-13, and SVM-14. Of these, detections in probes SVM-12 and SVM-14 were reported at concentrations above screening levels under residential and commercial scenarios. The highest detections were reported in the deepest (22-foot) probe depths near the hydrocarbon smear zone.

Based on the data collected thus far, SFPP recommends continued operation of the biosparge system at the maximum design rate of 500 scfm and continued monthly sampling of the south-central soil vapor monitoring network using the mobile laboratory contractor. Shallow soil vapor in the offsite area does not pose an unacceptable human health risk to residents based on the data collected during January and February 2016. The SVE system will continue to remain online during biosparging operations. Additional soil vapor monitoring reports will be prepared and submitted to the Regional Water Quality Control Board, Los Angeles Region and Restoration Advisory Board as new data become available.

If you have any questions regarding this report, please contact Dan Jablonski at (213) 228-8271, or Mr. Stephen Defibaugh, Kinder Morgan's Remediation Project Manager, at (714) 560-4802.

Regards,

CH2M HILL Engineers, Inc.

Dan Jablonski
Project Manager

John Lowe, CIH
Vapor Intrusion Consultant

Attachments:

References
Tables
- Table 1 – Soil Vapor Probe Field VOCs and Vacuum Readings
- Table 2 – Mobile Laboratory Soil Vapor Analytical Results – January 2016
- Table 3 – Mobile Laboratory Soil Vapor Analytical Results – February 2016

Figures
- Figure 1 – Site Location Map
- Figure 2 – Soil Vapor Monitoring Probe Locations
- Figure 3 – Typical Nested Soil Vapor Monitoring Probe Completion Diagram

Attachment A – Mobile Laboratory Analytical Reports (CD ROM)

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Tables

Table 1. Soil Vapor Probe Field VOCs and Vacuum Readings

SFPP Norwalk Pump Station, Norwalk, California

			Date		1/9/16		1/15/16		1/22/16		1/27/16 to 1/29/16		2/5/16		2/12/16		2/19/16		2/24/16 to 2/26/16	
			SVE System		On		On		On		On		On		On		On		On	
			BS System		On		On		On		On		On		On		On		On	
			BS Flow Rate (scfm)		120		180		240		360		500		500		500		500	
Probe	Location	Zone	Screen Interval (feet bgs) From	To	VOCs [1] (ppmv)	Vacuum ("H_2O)	VOCs [1] (ppmv)	Vacuum ("H_2O)	VOCs [1] (ppmv)	Vacuum ("H_2O)	VOCs [2] (ppmv)	Vacuum ("H_2O)	VOCs [2] (ppmv)	Vacuum ("H_2O)	VOCs [2] (ppmv)	Vacuum ("H_2O)	VOCs [2] (ppmv)	Vacuum ("H_2O)	VOCs [1] (ppmv)	Vacuum ("H_2O)
SVM-1	Offsite	Shallow	5	5.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SVM-1	Offsite	Deep	14.5	15	0	-2.7	0	-1.9	0	-2.2	0	-2	0	-2.3	0	-1.7	0	-1.9	0	-2.2
SVM-2	Offsite	Shallow	5	5.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SVM-2	Offsite	Deep	14.5	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SVM-3	Offsite	Shallow	5	5.5	0	0	0	0	0	0	0.4	0	0	0	0	0	0	0	0	0
SVM-3	Offsite	Deep	15	15.5	0	0	0	0	0	0	1.4	0	0	-0.5	0	-0.5	0	-0.7	0	0
SVM-5	Offsite	Shallow	5	5.5	0.2	-0.5	0	0	0	-0.8	0	0	0	0	0	0	0	-0.6	0	-0.8
SVM-5	Offsite	Deep	15.5	16	0.1	-5.8	0	-5.8	0	-6.4	0	-5.2	0	0	0	-4.4	0	-5	0	-7.3
SVM-6	Offsite	Shallow	6.5	7	0	0	0	0	0	0	1.7	0	0	0	0	0	0	0	0	0
SVM-6	Offsite	Deep	15.5	16	0	-3.2	0	-2.6	0	-3.1	0	-1.9	0	-0.8	520	0	153	-0.8	47	0
SVM-7	Offsite	Shallow	7	7.5	0	0	0	0	0	0	0.7	0	0	0	0	0	0	0	0	0
SVM-7	Offsite	Deep	13.25	13.75	0	0.6	0	0	0	0	0.3	0	0	0	0	0	0	0	0	0
SVM-8	Offsite	Shallow	5	5.5	0	0	0	0	0	-0.5	0.3	0	0	0	0	0	0	0	0	0
SVM-8	Offsite	Deep	15	15.5	0.5	-1.9	0	-2	0	-2.2	4.4	-1.8	0	-1.7	0	-1.4	0	-1.7	0	-1.2
SVM-10	Offsite	Shallow	7.5	8	--	--	--	--	--	-2.9	--	--	--	-11.7	--	--	--	--	--	--
SVM-10	Offsite	Deep	15.5	16	0	0.5	0	0	0	0	0.4	0	0	0	0	0	0	0	0	0
SVM-11	Onsite	Shallow	7	7.5	0.5	0	0	0	0	0	5.1	0	0	0	97	0	348	0	3.6	0
SVM-11	Onsite	Middle	15	15.5	0.5	0	0	-0.5	0	0	6	0	0	0	305	0	378	0	13.2	0
SVM-11	Onsite	Deep	21	21.5	0.2	0	0	0	0	0	--	--	--	--	128	0	>2000	0	0	0
SVM-12	Onsite	Shallow	7	7.5	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SVM-12	Onsite	Middle	15	15.5	0.3	0	0.1	0	0	0	0	0	0	0	0	0	9.2	0	16.3	0
SVM-12	Onsite	Deep	22	22.5	0.8	0	0.1	0	0	0	0	0	0	0	0	0.5	1266	0	2770	0
SVM-13	Onsite	Shallow	7	7.5	1.4	-0.9	0	-1.2	0	0	0	0	0	0	0	-4.1	>2000	-5.8	0	-5.1
SVM-13	Onsite	Middle	15.5	16	1.2	-5	0	-6.2	0	-5.5	0	-3.4	0	-2.9	0	-18.1	>2000	-19.7	0	-17.2
SVM-13	Onsite	Deep	22.5	23	>15000	-6.1	1500	-8.8	100.3	-8.9	>2000	-3.5	353	-2.6	1111	-16	554	-17.4	145	-16.1
SVM-14	Onsite	Shallow	7	7.5	>15000	0	160	0	1491	0	>2000	34.4	710	0	>2000	0.7	>2000	0	13000	0
SVM-14	Onsite	Middle	15	15.5	>15000	0.5	341.2	-0.6	3772	0	945	6	1471	0.9	>2000	1.4	>2000	0.8	>15000	1

Table 1. Soil Vapor Probe Field VOCs and Vacuum Readings

SFPP Norwalk Pump Station, Norwalk, California

			Date		1/9/16		1/15/16		1/22/16		1/27/16 to 1/29/16		2/5/16		2/12/16		2/19/16		2/24/16 to 2/26/16	
			SVE System		On		On		On		On		On		On		On		On	
			BS System		On		On		On		On		On		On		On		On	
			BS Flow Rate (scfm)		120		180		240		360		500		500		500		500	
Probe	Location	Zone	Screen Interval (feet bgs) From	To	VOCs [1] (ppmv)	Vacuum ("H_2O)	VOCs [1] (ppmv)	Vacuum ("H_2O)	VOCs [1] (ppmv)	Vacuum ("H_2O)	VOCs [2] (ppmv)	Vacuum ("H_2O)	VOCs [2] (ppmv)	Vacuum ("H_2O)	VOCs [2] (ppmv)	Vacuum ("H_2O)	VOCs [2] (ppmv)	Vacuum ("H_2O)	VOCs [1] (ppmv)	Vacuum ("H_2O)
SVM-14	Onsite	Deep	22	22.5	4195	6.6	>15000	1	>15000	7.5	>2000	0	>2000	45.7	>2000	55.5	>2000	53.2	>15000	52.4
SVM-15	Offsite	Shallow	7	7.5	0	0	0	0	0	0	2.6	0	0	0	0	0	0	0	0	0
SVM-15	Offsite	Middle	15	15.5	0	0	0	0	0	0	1.1	0	0	0	0	0	0	0	0	0
SVM-15	Offsite	Deep	22	22.5	0	-8.2	0	-8.9	0	-9.1	8.5	-3.8	82.3	-2.6	0	-2.7	20.48	-2.9	524	-2.9
SVM-16	Offsite	Shallow	7	7.5	0	0	0	0	0	0	3.3	0	0	0	0	0	0	0	0	0
SVM-16	Offsite	Middle	15.5	16	0.2	-1.1	0	-1.2	0	-1	0	-1.1	0	-1	0	-0.6	0	-1	0	0
SVM-16	Offsite	Deep	22	22.5	1.1	-1.8	8	0	7.6	-1.6	0	-1.7	0	-1.7	0	-1.2	0	1.6	2.3	-0.7

Notes:

[1] MiniRae 3000 PID calibrated to 50 ppmv hexane

[2] 4-gas meter MultieRae IR calibrated to 50 ppm hexane

Abbreviations:

VOCs = volatile organic compounds

PID - photoionization detector

SVE - soil vapor extraction

BS - Biosparge

scfm - standard cubic feet per minute

bgs - below ground surface

ppmv - parts per million by volume

"H_2O - inches of water

Table 2. Mobile Laboratory Soil Vapor Analytical Results - January 2016
SFPP Norwalk Pump Station, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [1, 2]	Current Commercial Soil Gas Screening Level [1, 2]	SVM-1-5 1/27/2016 SVM-1 5-5.5	SVM-1-15 1/27/2016 SVM-1 15-15.5	SVM-2-5 1/27/2016 SVM-2 5-5.5	SVM-3-5 1/27/2016 SVM-3 5-5.5	SVM-3-15 1/27/2016 SVM-3 15-15.5	SVM-3-5 DUP 1/27/2016 SVM-3 5-5.5	SVM-5-5 1/27/2016 SVM-5 5-5.5	SVM-5-15 1/27/2016 SVM-5 15-15.5	SVM-6-7 1/27/2016 SVM-6 7-7.5	SVM-6-16 R2 [4] 1/29/2016 SVM-6 16-16.5	SVM-7-7 1/27/2016 SVM-7 7-7.5	SVM-7-13 1/27/2016 SVM-7 13-13.5	SVM-8-5 1/28/2016 SVM-8 5-5.5	SVM-8-15 1/28/2016 SVM-8 15-15.5	SVM-10-15 1/27/2016 SVM-10 15-15.5
COPCs [5]	1,2,4-Trimethylbenzene	µg/L	7.3	31	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	1,2-Dichloroethane	µg/L	0.11	0.47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	1,3,5-Trimethylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	2-Propanol (leak test compound)	µg/L	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Benzene	µg/L	0.084	0.42	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Ethylbenzene	µg/L	1.1	4.9	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Isopropylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	m,p-Xylenes	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Naphthalene	µg/L	0.083	0.36	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	sec-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	Toluene	µg/L	310	1300	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.021**	<0.02
Other Detected Compounds	1,1,1,2-Tetrachloroethane	µg/L	130	530	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	2,2,4-Trimethylpentane	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Chloroform	µg/L	0.12	0.53	<0.02	<0.02	<0.02	<0.02	**0.056**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Cyclohexane	µg/L	6300	26000	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Ethanol	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.2**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Heptane	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Hexane	µg/L	730	3100	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.022**	<0.02
	TPH-g (C4-C12)	µg/L	630 [3]	2600 [3]	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	---	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	**19**	**19**	**19**	**18**	**19**	**18**	**19**	**19**	**19**	---	**19**	**18**	**19**	**19**	**17**
	Carbon Dioxide	% v/v	---	---	<0.1	<0.1	<0.1	<0.1	**0.17**	<0.1	<0.1	<0.1	<0.1	---	<0.1	<0.1	<0.1	<0.1	**3.8**

Table 2. Mobile Laboratory Soil Vapor Analytical Results - January 2016
SFPP Norwalk Pump Station, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [1, 2]	Current Commercial Soil Gas Screening Level [1, 2]	SVM-11-7 1/29/2016 SVM-11 7-7.5	SVM-11-15 1/29/2016 SVM-11 15-15.5	SVM-11-21 1/29/2016 SVM-11 21-21.5	SVM-12-7 1/29/2016 SVM-12 7-7.5	SVM-12-15 1/29/2016 SVM-12 15-15.5	SVM-12-22 1/29/2016 SVM-12 22-22.5	SVM-13-7 1/29/2016 SVM-13 7-7.5	SVM-13-15.5 1/29/2016 SVM-13 15.5-16	SVM-13-23 1/29/2016 SVM-13 23-23.5	SVM-14-7 1/29/2016 SVM-14 7-7.5	SVM-14-15 1/29/2016 SVM-14 15-15.5	SVM-14-15 DUP 1/29/2016 SVM-14 15-15.5	SVM-14-22 1/29/2016 SVM-14 22-22.5	SVM-15-7 1/27/2016 SVM-15 7-7.5
COPCs [5]	1,2,4-Trimethylbenzene	µg/L	7.3	31	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<4	<4	<4	<4	<200	<0.02
	1,2-Dichloroethane	µg/L	0.11	0.47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<4	<4	<4	<4	<200	<0.02
	1,3,5-Trimethylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<4	<4	<4	<4	<200	<0.02
	2-Propanol (leak test compound)	µg/L	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<40	<40	<40	<40	<2000	<0.2
	Benzene	µg/L	0.084	0.42	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**3.3**	<4	<4	<4	**2200**	<0.02
	Ethylbenzene	µg/L	1.1	4.9	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**13**	<4	<4	<4	<200	<0.02
	Isopropylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<4	<4	<4	<4	<200	<0.02
	m,p-Xylenes	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**35**	<4	<4	<4	**620**	<0.02
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<4	<4	<4	<4	<200	<0.02
	Naphthalene	µg/L	0.083	0.36	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<4	<4	<4	<4	<200	<0.02
	n-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<4	<4	<4	<4	<200	<0.02
	n-Propylbenzene	µg/L	1000	4400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<4	<4	<4	<4	<200	<0.02
	o-Xylene	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<4	<4	<4	<4	**200**	<0.02
	sec-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<4	<4	<4	<4	<200	<0.02
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20	<20	<20	<20	<20	<4000	<4000	<4000	<4000	<200000	<20
	Toluene	µg/L	310	1300	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**21**	<4	<4	<4	**3400**	<0.02
Other Detected Compounds	1,1,1,2-Tetrachloroethane	µg/L	130	530	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**15**	<4	<4	<4	<200	<0.02
	2,2,4-Trimethylpentane	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**87**	**77**	**44**	**42**	**3500**	<0.02
	Chloroform	µg/L	0.12	0.53	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<4	<4	<4	<4	<200	<0.02
	Cyclohexane	µg/L	6300	26000	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<4	<4	<4	<4	**1700**	<0.02
	Ethanol	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<4	<4	<4	<4	<200	<0.02
	Heptane	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**24**	**9.4**	**4.5**	**4.4**	**2500**	<0.02
	n-Hexane	µg/L	730	3100	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**18**	**8**	**4.4**	**4.1**	**3800**	<0.02
	TPH-g (C4-C12)	µg/L	630 [3]	2600 [3]	<20	<20	<20	<20	<20	<20	<20	<20	**1500**	**890**	**570**	**530**	**57000**	<20
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	**18**	**19**	**19**	**18**	**14**	**14**	**19**	**18**	**18**	**15**	**14**	**14**	**17**	**19**
	Carbon Dioxide	% v/v	---	---	<0.1	**0.19**	**0.29**	**0.24**	**3**	**3**	<0.1	<0.1	**0.85**	**0.14**	**3.6**	**3.5**	**0.71**	<0.1

Table 2. Mobile Laboratory Soil Vapor Analytical Results - January 2016
SFPP Norwalk Pump Station, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [1, 2]	Current Commercial Soil Gas Screening Level [1, 2]	SVM-15-15 1/27/2016 SVM-15 15-15.5	SVM-15-22 1/27/2016 SVM-15 22-22.5	SVM-16-7 1/28/2016 SVM-16 7-7.5	SVM-16-16 R2 [4] 1/29/2016 SVM-16 16-16.5	SVM-16-22 R2 [4] 1/29/2016 SVM-16 22-22.5	SVM-16-22 DUP 1/28/2016 SVM-16 22-22.5	SVM-16-22 DUP RR [4] 1/28/2016 SVM-16 22-22.5	Ambient Air 1/27/2016	Ambient Air 1/28/2016	Ambient Air 1/29/2016
COPCs [5]	1,2,4-Trimethylbenzene	µg/L	7.3	31	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	<0.02
	1,2-Dichloroethane	µg/L	0.11	0.47	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	<0.02
	1,3,5-Trimethylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	<0.02
	2-Propanol (leak test compound)	µg/L	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	---	---	<0.2	<0.2	<0.2
	Benzene	µg/L	0.084	0.42	<0.02	<0.02	<0.02	<0.02	**0.07**	---	---	<0.02	<0.02	<0.02
	Ethylbenzene	µg/L	1.1	4.9	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	<0.02
	Isopropylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	<0.02
	m,p-Xylenes	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	**0.048**	---	---	<0.02	<0.02	<0.02
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	<0.02
	Naphthalene	µg/L	0.083	0.36	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	<0.02
	n-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	**0.021**	---	---	<0.02	<0.02	<0.02
	sec-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20	<20	---	---	<20	<20	<20
	Toluene	µg/L	310	1300	<0.02	<0.02	<0.02	<0.02	**0.2**	---	---	<0.02	<0.02	<0.02
Other Detected Compounds	1,1,1,2-Tetrachloroethane	µg/L	130	530	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	<0.02
	2,2,4-Trimethylpentane	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	**0.26**	---	---	<0.02	<0.02	<0.02
	Chloroform	µg/L	0.12	0.53	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	<0.02
	Cyclohexane	µg/L	6300	26000	<0.02	<0.02	<0.02	<0.02	**0.071**	---	---	<0.02	<0.02	<0.02
	Ethanol	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	<0.02
	Heptane	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	**0.11**	---	---	<0.02	<0.02	<0.02
	n-Hexane	µg/L	730	3100	<0.02	<0.02	<0.02	<0.02	**0.18**	---	---	<0.02	<0.02	<0.02
	TPH-g (C4-C12)	µg/L	630 [3]	2600 [3]	<20	<20	<20	<20	<20	---	---	<20	<20	<20
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	---	---	<0.1	<0.1	<0.1	---	<0.1
	Oxygen	% v/v	---	---	**19**	**18**	**19**	---	---	14	**19**	**19**	---	**18**
	Carbon Dioxide	% v/v	---	---	<0.1	<0.1	**0.23**	---	---	**3.9**	<0.1	<0.1	---	<0.1

Notes:

[1] Source for the Indoor Air Screening Levels: DTSC. 2016. Human Health Risk Assessment (HHRA) Note Number 3: DTSC Recommended Methodology for use of U.S. EPA Regional Screening Levels (RSLs) in the Human Health Risk Assessment Process at Hazardous Waste Sites and Permitted Facilities. https://www.dtsc.ca.gov/AssessingRisk/upload/HHRA-Note-3-2016-01.pdf

[2] Attenuation factor for current land use = 0.001. Source for the attenuation factors: DTSC. 2011. Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance). October. http://www.dtsc.ca.gov/AssessingRisk/upload/Final_VIG_Oct_2011.pd

[3] TPH aliphatic low screening level used for TPH-g screening levels

[4] RR or R2 indicate a re-run was performed as a result of 2-propanol (leak test compound) detection in original sample

[5] Chemicals of potential concern identified from 2006 soil gas investigation and human health risk assessment (Geomatrix, 2006)

13 Yellow highlighting indicates concentration exceeds human health screening level under residential and/or commercial scenarios.

--- = not available
% v/v = percent volume by volume
<0.02 = not detected at the laboratory minimum reporting limit
µg/L = micrograms per liter
COPCs = chemicals of potential concern
DUP = field duplicate
J = the analyte was positively detected but is estimated
TPH-g = total petroleum hydrocarbons quantified as gasoline

5-5.5 = sample depth in feet below round surfac
1/27/2016 = sample date
SVM-1 = sample location
SVM-1-5 = sample ID

Table 3. Mobile Laboratory Soil Vapor Analytical Results - February 2016

SFPP Norwalk Pump Station, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [1, 2]	Current Commercial Soil Gas Screening Level [1, 2]	SVM-1-5 2/24/2016 SVM-1 5-5.5	SVM-1-15 2/24/2016 SVM-1 15-15.5	SVM-2-5 2/24/2016 SVM-2 5-5.5	SVM-3-5 2/25/2016 SVM-3 5-5.5	SVM-3-5 DUP 2/25/2016 SVM-3 5-5.5	SVM-3-15 2/25/2016 SVM-3 15-15.5	SVM-5-5 2/25/2016 SVM-5 5-5.5	SVM-5-15 2/25/2016 SVM-5 15-15.5	SVM-6-7 2/24/2016 SVM-6 7-7.5	SVM-6-16 2/24/2016 SVM-6 16-16.5	SVM-6-16 DUP 2/24/2016 SVM-6 16-16.5	SVM-7-7 2/24/2016 SVM-7 7-7.5	SVM-7-13 2/24/2016 SVM-7 13-13.5	SVM-8-5 2/25/2016 SVM-8 5-5.5
COPCs [4]	1,2,4-Trimethylbenzene	µg/L	7.3	31	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
	1,2-Dichloroethane	µg/L	0.11	0.47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
	1,3,5-Trimethylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
	2-Propanol (leak test compound)	µg/L	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.8	<0.2	<0.2	<0.2
	Benzene	µg/L	0.084	0.42	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
	Ethylbenzene	µg/L	1.1	4.9	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
	Isopropylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
	m,p-Xylenes	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
	Naphthalene	µg/L	0.083	0.36	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
	n-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
	sec-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20	<20	<20	<20	<20	<20	<40	<80	<20	<20	<20
	Toluene	µg/L	310	1300	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
Other Detected Compounds	2,2,4-Trimethylpentane	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.088**	**5.6**	**6.1**	<0.02	<0.02	<0.02
	4-Ethyltoluene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
	Cyclohexane	µg/L	6300	26000	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.46**	**0.42**	<0.02	<0.02	<0.02
	Heptane	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.08	<0.02	<0.02	<0.02
	n-Hexane	µg/L	730	3100	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**0.43**	**0.41**	<0.02	<0.02	<0.02
	TPH-g (C4-C12)	µg/L	630 [3]	2600 [3]	<20	<20	<20	<20	<20	<20	<20	<20	<20	**31**	**33**	<20	<20	<20
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	**19**	**19**	**19**	**19**	**18**	**18**	**19**	**19**	**19**	**19**	**19**	**19**	**19**	**19**
	Carbon Dioxide	% v/v	---	---	**0.24**	<0.1	<0.1	**0.14**	**0.14**	**0.14**	<0.1	<0.1	<0.1	<0.1	<0.1	**0.12**	**0.18**	**0.11**

Table 3. Mobile Laboratory Soil Vapor Analytical Results - February 2016

SFPP Norwalk Pump Station, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [1, 2]	Current Commercial Soil Gas Screening Level [1, 2]	SVM-8-15 2/25/2016 SVM-8 15-15.5	SVM-10-15 2/24/2016 SVM-10 15-15.5	SVM-11-7 2/26/2016 SVM-11 7-7.5	SVM-11-15 2/26/2016 SVM-11 15-15.5	SVM-11-22 2/26/2016 SVM-11 22-22.5	SVM-12-7 2/25/2016 SVM-12 7-7.5	SVM-12-15 2/25/2016 SVM-12 15-15.5	SVM-12-22 2/25/2016 SVM-12 22-22.5	SVM-13-7 2/26/2016 SVM-13 7-7.5	SVM-13-15.5 2/26/2016 SVM-13 15.5-16	SVM-13-22.5 2/26/2016 SVM-13 22.5-23	SVM-14-7 2/26/2016 SVM-14 7-7.5	SVM-14-15 2/26/2016 SVM-14 15-15.5	SVM-14-15 DUP 2/26/2016 SVM-14 15-15.5
COPCs [4]	1,2,4-Trimethylbenzene	µg/L	7.3	31	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<10	<0.02	<0.02	<0.4	<10	<20	<20
	1,2-Dichloroethane	µg/L	0.11	0.47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<10	<0.02	<0.02	<0.4	<10	<20	<20
	1,3,5-Trimethylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<10	<0.02	<0.02	<0.4	<10	<20	<20
	2-Propanol (leak test compound)	µg/L	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<100	<0.2	<0.2	<4	<100	<200	<200
	Benzene	µg/L	0.084	0.42	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**10**	<0.02	<0.02	<0.4	<10	<20	<20
	Ethylbenzene	µg/L	1.1	4.9	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<10	<0.02	<0.02	<0.4	<10	<20	<20
	Isopropylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<10	<0.02	<0.02	<0.4	<10	<20	<20
	m,p-Xylenes	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<10	<0.02	<0.02	<0.4	**15**	**240**	**260**
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<10	<0.02	<0.02	<0.4	<10	<20	<20
	Naphthalene	µg/L	0.083	0.36	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<10	<0.02	<0.02	<0.4	<10	<20	<20
	n-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<10	<0.02	<0.02	<0.4	<10	<20	<20
	n-Propylbenzene	µg/L	1000	4400	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<10	<0.02	<0.02	<0.4	<10	<20	<20
	o-Xylene	µg/L	100	440	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<10	<0.02	<0.02	<0.4	**22**	**120**	**130**
	sec-Butylbenzene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<10	<0.02	<0.02	<0.4	<10	<20	<20
	tert-Butanol (TBA)	µg/L	---	---	<20	<20	<20	<20	<20	<20	<20	<10000	<20	<20	<400	<10000	<20000	<20000
	Toluene	µg/L	310	1300	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<10	<0.02	<0.02	<0.4	<10	**360**	**340**
Other Detected Compounds	2,2,4-Trimethylpentane	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**2**	**420**	<0.02	<0.02	**4.7**	**78**	**180**	210
	4-Ethyltoluene	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<10	<0.02	<0.02	<0.4	<10	<20	<20
	Cyclohexane	µg/L	6300	26000	<0.02	<0.02	**0.13**	**0.038**	<0.02	<0.02	**0.034**	**60**	<0.02	<0.02	**1.8**	**14**	**21**	21
	Heptane	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**49**	<0.02	<0.02	**0.6**	**12**	**76**	73
	n-Hexane	µg/L	730	3100	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	**67**	<0.02	<0.02	**3.8**	<10	<20	22
	TPH-g (C4-C12)	µg/L	630 [3]	2600 [3]	<20	<20	<20	<20	<20	<20	<20	**3300**	<20	<20	**74**	**1600**	**4100**	**4500**
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Oxygen	% v/v	---	---	**19**	**17**	**18**	**15**	**19**	**17**	**11**	**1.1**	**19**	**19**	**15**	**16**	**16**	16
	Carbon Dioxide	% v/v	---	---	**0.1**	**3.7**	**0.17**	**0.28**	**0.26**	**0.35**	**1.5**	**11**	<0.1	<0.1	**2.1**	**2.5**	**2.3**	2.3

Table 3. Mobile Laboratory Soil Vapor Analytical Results - February 2016

SFPP Norwalk Pump Station, Norwalk, California

Analyte Type	Analyte	Unit	Current Residential Soil Gas Screening Level [1, 2]	Current Commercial Soil Gas Screening Level [1, 2]	SVM-14-22 2/26/2016 SVM-14 22-22.5	SVM-15-7 2/24/2016 SVM-15 7-7.5	SVM-15-15 2/24/2016 SVM-15 15-15.5	SVM-15-22 2/24/2016 SVM-15 22-22.5	SVM-16-7 2/25/2016 SVM-16 7-7.5	SVM-16-16 2/25/2016 SVM-16 16-16.5	SVM-16-22 2/25/2016 SVM-16 22-22.5	SVM-16-22 DUP 2/25/2016 SVM-16 22-22.5	AMBIENT AIR 2/24/2016	AMBIENT AIR 2/25/2016	AMBIENT AIR 2/26/2016
COPCs [4]	1,2,4-Trimethylbenzene	µg/L	7.3	31	**63**	<0.02	<0.02	<0.8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	1,2-Dichloroethane	µg/L	0.11	0.47	<50	<0.02	<0.02	<0.8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	1,3,5-Trimethylbenzene	µg/L	---	---	<50	<0.02	<0.02	**0.84**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	2-Propanol (leak test compound)	µg/L	---	---	<500	<0.2	<0.2	<8	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Benzene	µg/L	0.084	0.42	<50	<0.02	<0.02	**1.7**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Ethylbenzene	µg/L	1.1	4.9	**170**	<0.02	<0.02	<0.8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Isopropylbenzene	µg/L	---	---	<50	<0.02	<0.02	<0.8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	m,p-Xylenes	µg/L	100	440	**1200**	<0.02	<0.02	**8.9**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Methyl tert-butyl ether (MTBE)	µg/L	11	47	<50	<0.02	<0.02	<0.8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Naphthalene	µg/L	0.083	0.36	<50	<0.02	<0.02	<0.8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Butylbenzene	µg/L	---	---	<50	<0.02	<0.02	<0.8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Propylbenzene	µg/L	1000	4400	<50	<0.02	<0.02	<0.8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	o-Xylene	µg/L	100	440	**310**	<0.02	<0.02	**6.8**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	sec-Butylbenzene	µg/L	---	---	<50	<0.02	<0.02	<0.8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	tert-Butanol (TBA)	µg/L	---	---	<50000	<20	<20	<800	<20	<20	<20	<20	<20	<20	<20
	Toluene	µg/L	310	1300	**730**	<0.02	<0.02	**2.2**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Other Detected Compounds	2,2,4-Trimethylpentane	µg/L	---	---	**190**	<0.02	<0.02	**49**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	4-Ethyltoluene	µg/L	---	---	**100**	<0.02	<0.02	<0.8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Cyclohexane	µg/L	6300	26000	<50	<0.02	<0.02	**5.1**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Heptane	µg/L	---	---	**130**	<0.02	<0.02	<0.8	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	n-Hexane	µg/L	730	3100	<50	<0.02	<0.02	**3.1**	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	TPH-g (C4-C12)	µg/L	630 [3]	2600 [3]	**9400**	<20	<20	**310**	<20	<20	<20	<20	<20	<20	<20
Fixed Gases	Methane	% v/v	---	---	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	---	---	---
	Oxygen	% v/v	---	---	**18**	**19**	**19**	**17**	**19**	**18**	**11**	**11**	---	---	---
	Carbon Dioxide	% v/v	---	---	**0.47**	<0.1	<0.1	**1.1**	**0.16**	**0.53**	**5.9**	**5.7**	---	---	---

Notes:

[1] Source for the Indoor Air Screening Levels: DTSC. 2016. Human Health Risk Assessment (HHRA) Note Number 3: DTSC Recommended Methodology for use of U.S. EPA Regional Screening Levels (RSLs) in the Human Health Risk Assessment Process at Hazardous Waste Sites and Permitted Facilities.
https://www.dtsc.ca.gov/AssessingRisk/upload/HHRA-Note-3-2016-01.pdf

[2] Attenuation factor for current land use = 0.001. Source for the attenuation factors: DTSC. 2011. Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance). October. http://www.dtsc.ca.gov/AssessingRisk/upload/Final_VIG_Oct_2011.pdf

[3] TPH aliphatic low screening level used for TPH-g screening levels

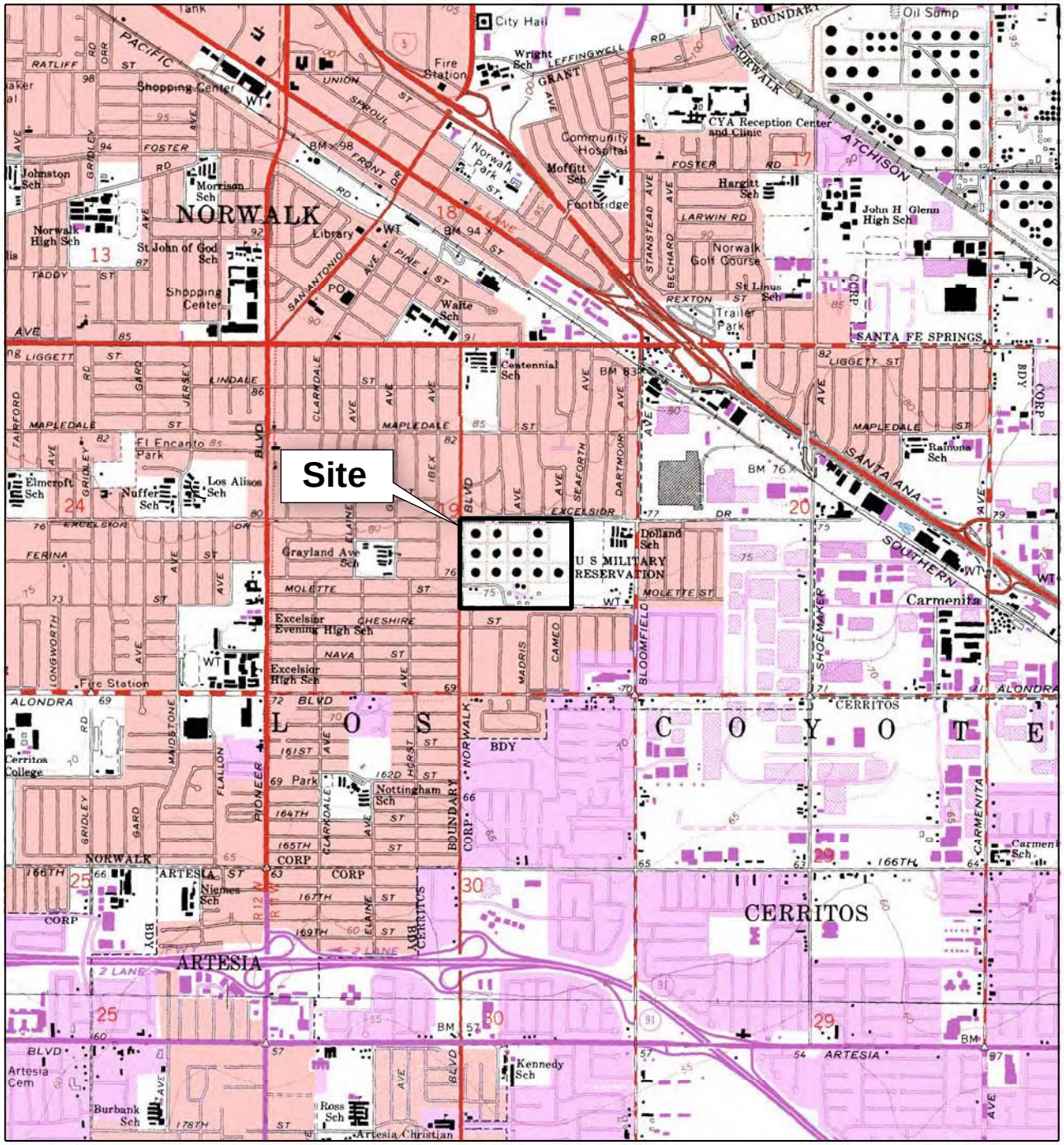
[4] Chemicals of potential concern identified from 2006 soil gas investigation and human health risk assessment (Geomatrix, 2006)

10 Yellow highlighting indicates concentration exceeds human health screening level under residential and/or commercial scenarios.

--- = not available
% v/v = percent volume by volume
<0.02 = not detected at the laboratory minimum reporting limit
µg/L = micrograms per liter
COPCs = chemicals of potential concern
DUP = field duplicate
J = the analyte was positively detected but is estimated
TPH-g = total petroleum hydrocarbons quantified as gasoline

5-5.5 = sample depth in feet below ground surface
2/24/2016 = sample date
SVM-1 = sample location
SVM-1-5 = sample ID

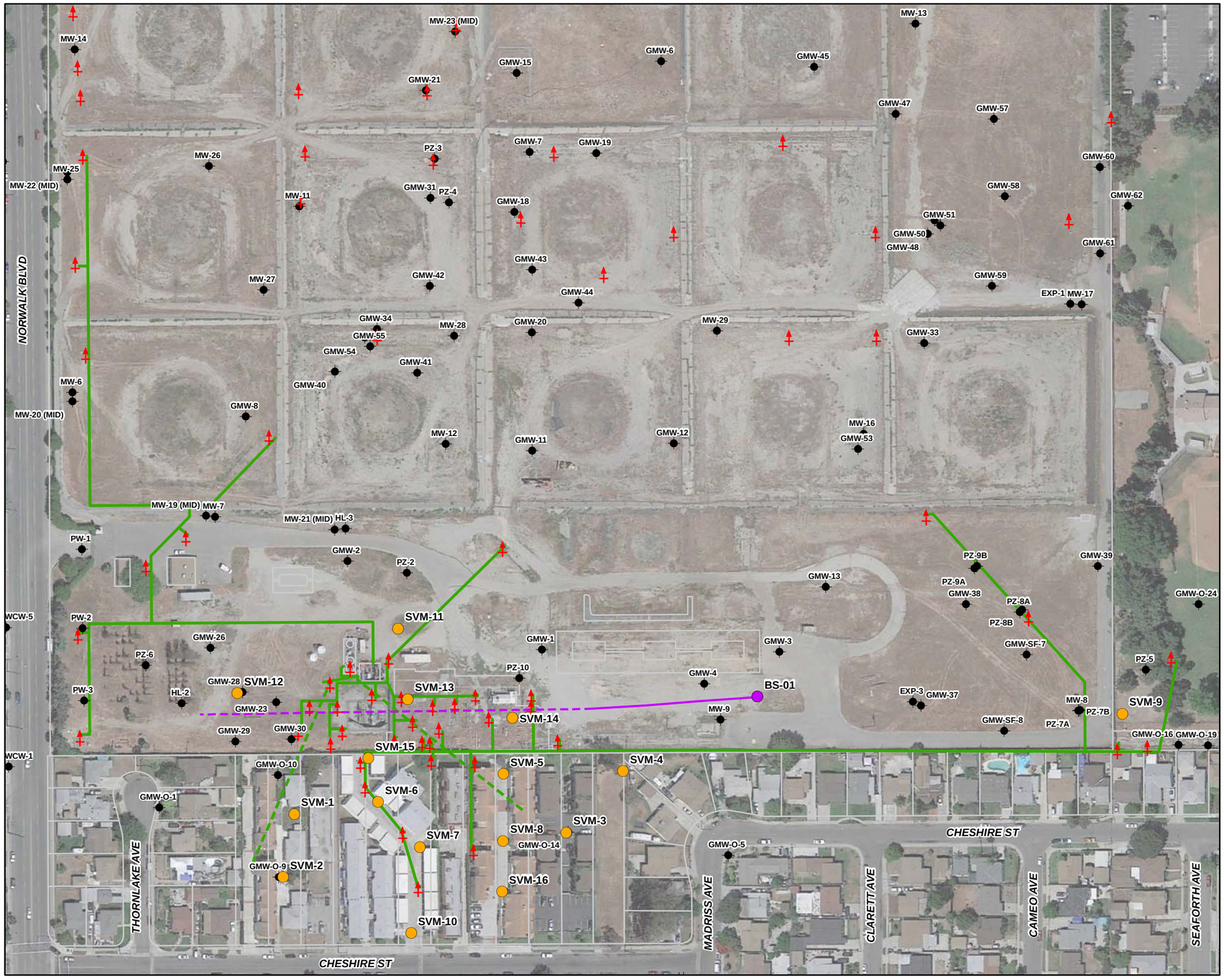
Figures



BASEMAP MODIFIED FROM U.S.G.S. 7.5 MINUTE QUADRANGLE MAP
LOS ALAMITOS 1964, CALIFORNIA. PHOTO-REVISED 1981.
WHITTIER 1965, CALIFORNIA. PHOTO-REVISED 1981.

Figure 1
Site Location Map
SFPP Norwalk Pump Station
Norwalk, California

ch2m



Legend

- Soil Vapor Monitoring Probes
- Horizontal Biosparge Well Entry Point
- Existing Groundwater Monitoring Well
- Existing Remediation Well
- Horizontal Biosparge Well (dashed line depicts approximate lateral extent of well screen)
- KMEP Remediation Piping Layout (above ground and below ground)
- Horizontal Vapor Extraction Well Piping

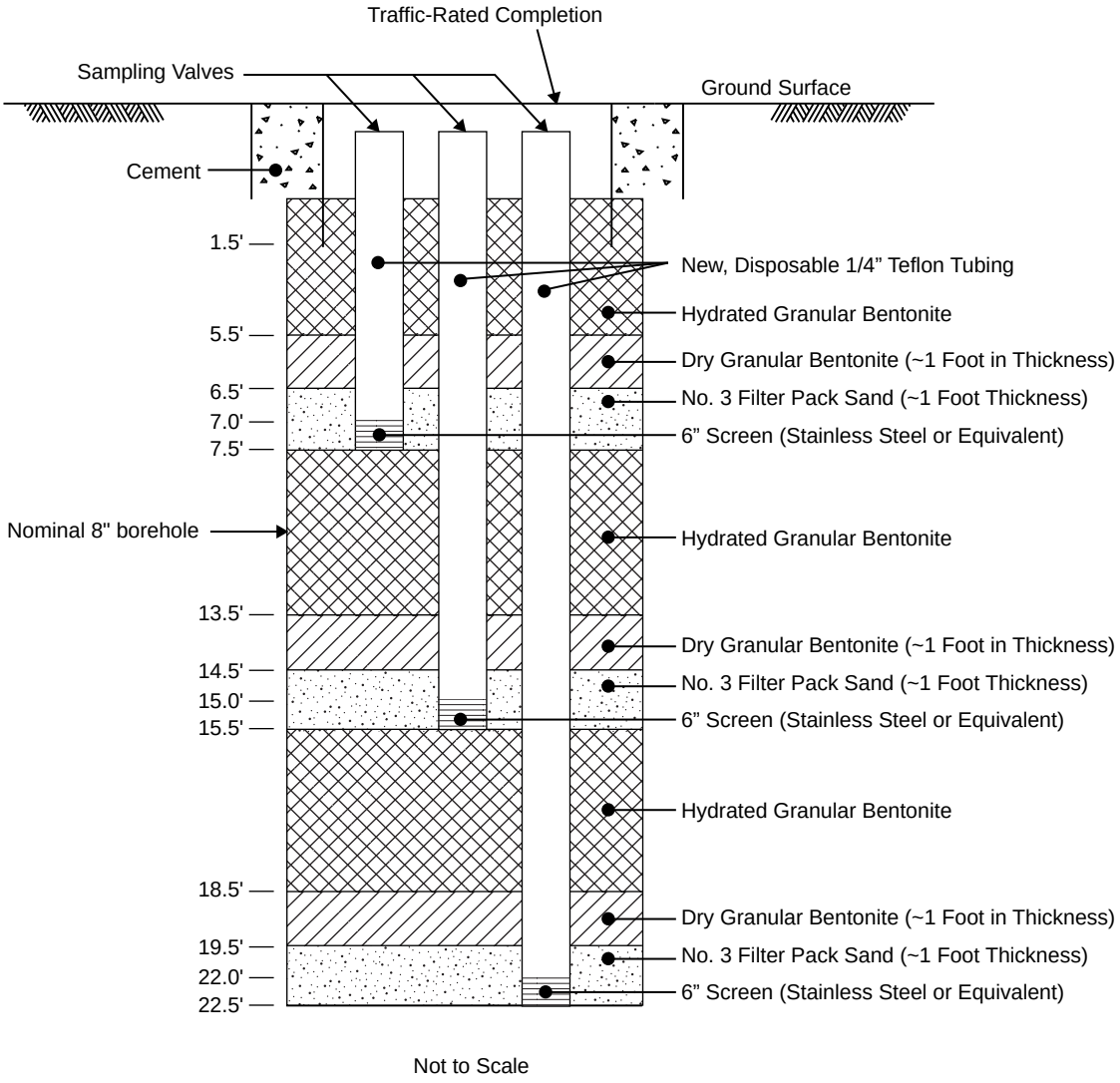
Imagery Source:
Google Earth April 17, 2013.

N

0 75 150 300
Feet

1 inch = 150 feet

Figure 2
Soil Vapor Monitoring Probe Locations
SFPP Norwalk Pump Station
Norwalk, California



Not to Scale

Figure 3
Typical Nested Soil Vapor Monitoring Probe Completion Diagram
SFPP Norwalk Pump Station
Norwalk, California

Attachment A
Mobile Laboratory Analytical Reports (CD ROM)

AMERICAN ANALYTICS

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February 12, 2016

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Re : KMEP Norwalk Biosparge Startup / 496965.A1.01

MB187306 / 6B02021

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received on 01/29/16 19:00 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Program Manual, applicable standard operating procedures, and other related documentation. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report or require additional information please call me at American Analytics.

Sincerely,

Allen Aminian

QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
Fixed Gases - Field					
SVM-1-5	6B02021-01	Vapor	10	01/27/16 08:37	01/29/16 19:00
SVM-2-5	6B02021-02	Vapor	10	01/27/16 08:51	01/29/16 19:00
SVM-1-15	6B02021-03	Vapor	10	01/27/16 08:59	01/29/16 19:00
SVM-15-7	6B02021-04	Vapor	10	01/27/16 10:37	01/29/16 19:00
SVM-15-15	6B02021-05	Vapor	10	01/27/16 10:48	01/29/16 19:00
SVM-15-22	6B02021-06	Vapor	10	01/27/16 11:03	01/29/16 19:00
SVM-6-7	6B02021-07	Vapor	10	01/27/16 11:36	01/29/16 19:00
SVM-6-16	6B02021-08	Vapor	10	01/27/16 11:50	01/29/16 19:00
SVM-7-7	6B02021-09	Vapor	10	01/27/16 12:21	01/29/16 19:00
SVM-7-13	6B02021-10	Vapor	10	01/27/16 12:33	01/29/16 19:00
SVM-10-15	6B02021-11	Vapor	10	01/27/16 13:23	01/29/16 19:00
SVM-3-15	6B02021-12	Vapor	10	01/27/16 13:46	01/29/16 19:00
SVM-3-5	6B02021-13	Vapor	10	01/27/16 14:05	01/29/16 19:00
SVM-3-5 DUP	6B02021-14	Vapor	10	01/27/16 14:05	01/29/16 19:00
SVM-5-15	6B02021-15	Vapor	10	01/27/16 14:55	01/29/16 19:00
SVM-5-5	6B02021-16	Vapor	10	01/27/16 14:56	01/29/16 19:00
AMBIENT AIR	6B02021-17	Vapor	10	01/27/16 15:04	01/29/16 19:00
SVM-8-15	6B02021-18	Vapor	10	01/28/16 08:05	01/29/16 19:00
SVM-8-5	6B02021-19	Vapor	10	01/28/16 08:24	01/29/16 19:00

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LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
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Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-16-7	6B02021-20	Vapor	10	01/28/16 09:04	01/29/16 19:00
SVM-16-16	6B02021-21	Vapor	10	01/28/16 09:25	01/29/16 19:00
SVM-16-22	6B02021-22	Vapor	10	01/28/16 09:36	01/29/16 19:00
SVM-16-22 DUP	6B02021-23	Vapor	10	01/28/16 09:36	01/29/16 19:00
SVM-6-16 RR	6B02021-24	Vapor	10	01/28/16 10:58	01/29/16 19:00
SVM-16-16 RR	6B02021-25	Vapor	10	01/28/16 11:53	01/29/16 19:00
SVM-16-22 RR	6B02021-26	Vapor	10	01/28/16 12:06	01/29/16 19:00
SVM-16-22 DUP RR	6B02021-27	Vapor	10	01/28/16 12:06	01/29/16 19:00
SVM-11-7	6B02021-29	Vapor	10	01/29/16 08:14	01/29/16 19:00
SVM-11-21	6B02021-30	Vapor	10	01/29/16 08:17	01/29/16 19:00
SVM-11-15	6B02021-31	Vapor	10	01/29/16 08:31	01/29/16 19:00
SVM-12-7	6B02021-32	Vapor	10	01/29/16 09:38	01/29/16 19:00
SVM-12-22	6B02021-33	Vapor	10	01/29/16 09:41	01/29/16 19:00
SVM-12-15	6B02021-34	Vapor	10	01/29/16 09:57	01/29/16 19:00
SVM-13-23	6B02021-35	Vapor	10	01/29/16 10:51	01/29/16 19:00
SVM-13-7	6B02021-36	Vapor	10	01/29/16 10:55	01/29/16 19:00
SVM-13-15.5	6B02021-37	Vapor	10	01/29/16 11:19	01/29/16 19:00
SVM-14-22	6B02021-38	Vapor	10	01/29/16 12:23	01/29/16 19:00
SVM-14-7	6B02021-39	Vapor	10	01/29/16 12:28	01/29/16 19:00
SVM-14-15	6B02021-40	Vapor	10	01/29/16 12:46	01/29/16 19:00

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Date Received: 01/29/16
Date Reported: 02/12/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-14-15 DUP	6B02021-41	Vapor	10	01/29/16 12:46	01/29/16 19:00
AMBIENT AIR	6B02021-42	Vapor	10	01/29/16 12:52	01/29/16 19:00
TO-15 (Mid Level)					
SVM-1-5	6B02021-01	Vapor	10	01/27/16 08:37	01/29/16 19:00
SVM-2-5	6B02021-02	Vapor	10	01/27/16 08:51	01/29/16 19:00
SVM-1-15	6B02021-03	Vapor	10	01/27/16 08:59	01/29/16 19:00
SVM-15-7	6B02021-04	Vapor	10	01/27/16 10:37	01/29/16 19:00
SVM-15-15	6B02021-05	Vapor	10	01/27/16 10:48	01/29/16 19:00
SVM-15-22	6B02021-06	Vapor	10	01/27/16 11:03	01/29/16 19:00
SVM-6-7	6B02021-07	Vapor	10	01/27/16 11:36	01/29/16 19:00
SVM-6-16	6B02021-08	Vapor	10	01/27/16 11:50	01/29/16 19:00
SVM-7-7	6B02021-09	Vapor	10	01/27/16 12:21	01/29/16 19:00
SVM-7-13	6B02021-10	Vapor	10	01/27/16 12:33	01/29/16 19:00
SVM-10-15	6B02021-11	Vapor	10	01/27/16 13:23	01/29/16 19:00
SVM-3-15	6B02021-12	Vapor	10	01/27/16 13:46	01/29/16 19:00
SVM-3-5	6B02021-13	Vapor	10	01/27/16 14:05	01/29/16 19:00
SVM-3-5 DUP	6B02021-14	Vapor	10	01/27/16 14:05	01/29/16 19:00
SVM-5-15	6B02021-15	Vapor	10	01/27/16 14:55	01/29/16 19:00
SVM-5-5	6B02021-16	Vapor	10	01/27/16 14:56	01/29/16 19:00
AMBIENT AIR	6B02021-17	Vapor	10	01/27/16 15:04	01/29/16 19:00

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Date Received: 01/29/16
Date Reported: 02/12/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-8-15	6B02021-18	Vapor	10	01/28/16 08:05	01/29/16 19:00
SVM-8-5	6B02021-19	Vapor	10	01/28/16 08:24	01/29/16 19:00
SVM-16-7	6B02021-20	Vapor	10	01/28/16 09:04	01/29/16 19:00
SVM-16-16	6B02021-21	Vapor	10	01/28/16 09:25	01/29/16 19:00
SVM-16-22	6B02021-22	Vapor	10	01/28/16 09:36	01/29/16 19:00
SVM-6-16 RR	6B02021-24	Vapor	10	01/28/16 10:58	01/29/16 19:00
SVM-16-16 RR	6B02021-25	Vapor	10	01/28/16 11:53	01/29/16 19:00
SVM-16-22 RR	6B02021-26	Vapor	10	01/28/16 12:06	01/29/16 19:00
AMBIENT AIR	6B02021-28	Vapor	10	01/28/16 14:20	01/29/16 19:00
SVM-11-7	6B02021-29	Vapor	10	01/29/16 08:14	01/29/16 19:00
SVM-11-21	6B02021-30	Vapor	10	01/29/16 08:17	01/29/16 19:00
SVM-11-15	6B02021-31	Vapor	10	01/29/16 08:31	01/29/16 19:00
SVM-12-7	6B02021-32	Vapor	10	01/29/16 09:38	01/29/16 19:00
SVM-12-22	6B02021-33	Vapor	10	01/29/16 09:41	01/29/16 19:00
SVM-12-15	6B02021-34	Vapor	10	01/29/16 09:57	01/29/16 19:00
SVM-13-23	6B02021-35	Vapor	10	01/29/16 10:51	01/29/16 19:00
SVM-13-7	6B02021-36	Vapor	10	01/29/16 10:55	01/29/16 19:00
SVM-13-15.5	6B02021-37	Vapor	10	01/29/16 11:19	01/29/16 19:00
SVM-14-22	6B02021-38	Vapor	10	01/29/16 12:23	01/29/16 19:00
SVM-14-7	6B02021-39	Vapor	10	01/29/16 12:28	01/29/16 19:00

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Date Received: 01/29/16
Date Reported: 02/12/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-14-15	6B02021-40	Vapor	10	01/29/16 12:46	01/29/16 19:00
SVM-14-15 DUP	6B02021-41	Vapor	10	01/29/16 12:46	01/29/16 19:00
AMBIENT AIR	6B02021-42	Vapor	10	01/29/16 12:52	01/29/16 19:00
SVM-16-16 R2	6B02021-43	Vapor	10	01/29/16 16:15	01/29/16 19:00
SVM-16-22 R2	6B02021-44	Vapor	10	01/29/16 16:15	01/29/16 19:00
SVM-6-16 R2	6B02021-45	Vapor	10	01/29/16 17:00	01/29/16 19:00
TO-3					
SVM-1-5	6B02021-01	Vapor	10	01/27/16 08:37	01/29/16 19:00
SVM-2-5	6B02021-02	Vapor	10	01/27/16 08:51	01/29/16 19:00
SVM-1-15	6B02021-03	Vapor	10	01/27/16 08:59	01/29/16 19:00
SVM-15-7	6B02021-04	Vapor	10	01/27/16 10:37	01/29/16 19:00
SVM-15-15	6B02021-05	Vapor	10	01/27/16 10:48	01/29/16 19:00
SVM-15-22	6B02021-06	Vapor	10	01/27/16 11:03	01/29/16 19:00
SVM-6-7	6B02021-07	Vapor	10	01/27/16 11:36	01/29/16 19:00
SVM-6-16	6B02021-08	Vapor	10	01/27/16 11:50	01/29/16 19:00
SVM-7-7	6B02021-09	Vapor	10	01/27/16 12:21	01/29/16 19:00
SVM-7-13	6B02021-10	Vapor	10	01/27/16 12:33	01/29/16 19:00
SVM-10-15	6B02021-11	Vapor	10	01/27/16 13:23	01/29/16 19:00
SVM-3-15	6B02021-12	Vapor	10	01/27/16 13:46	01/29/16 19:00
SVM-3-5	6B02021-13	Vapor	10	01/27/16 14:05	01/29/16 19:00

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Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-3-5 DUP	6B02021-14	Vapor	10	01/27/16 14:05	01/29/16 19:00
SVM-5-15	6B02021-15	Vapor	10	01/27/16 14:55	01/29/16 19:00
SVM-5-5	6B02021-16	Vapor	10	01/27/16 14:56	01/29/16 19:00
AMBIENT AIR	6B02021-17	Vapor	10	01/27/16 15:04	01/29/16 19:00
SVM-8-15	6B02021-18	Vapor	10	01/28/16 08:05	01/29/16 19:00
SVM-8-5	6B02021-19	Vapor	10	01/28/16 08:24	01/29/16 19:00
SVM-16-7	6B02021-20	Vapor	10	01/28/16 09:04	01/29/16 19:00
SVM-16-16	6B02021-21	Vapor	10	01/28/16 09:25	01/29/16 19:00
SVM-16-22	6B02021-22	Vapor	10	01/28/16 09:36	01/29/16 19:00
SVM-6-16 RR	6B02021-24	Vapor	10	01/28/16 10:58	01/29/16 19:00
SVM-16-16 RR	6B02021-25	Vapor	10	01/28/16 11:53	01/29/16 19:00
SVM-16-22 RR	6B02021-26	Vapor	10	01/28/16 12:06	01/29/16 19:00
AMBIENT AIR	6B02021-28	Vapor	10	01/28/16 14:20	01/29/16 19:00
SVM-11-7	6B02021-29	Vapor	10	01/29/16 08:14	01/29/16 19:00
SVM-11-21	6B02021-30	Vapor	10	01/29/16 08:17	01/29/16 19:00
SVM-11-15	6B02021-31	Vapor	10	01/29/16 08:31	01/29/16 19:00
SVM-12-7	6B02021-32	Vapor	10	01/29/16 09:38	01/29/16 19:00
SVM-12-22	6B02021-33	Vapor	10	01/29/16 09:41	01/29/16 19:00
SVM-12-15	6B02021-34	Vapor	10	01/29/16 09:57	01/29/16 19:00
SVM-13-23	6B02021-35	Vapor	10	01/29/16 10:51	01/29/16 19:00

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Date Reported: 02/12/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-13-7	6B02021-36	Vapor	10	01/29/16 10:55	01/29/16 19:00
SVM-13-15.5	6B02021-37	Vapor	10	01/29/16 11:19	01/29/16 19:00
SVM-14-22	6B02021-38	Vapor	10	01/29/16 12:23	01/29/16 19:00
SVM-14-7	6B02021-39	Vapor	10	01/29/16 12:28	01/29/16 19:00
SVM-14-15	6B02021-40	Vapor	10	01/29/16 12:46	01/29/16 19:00
SVM-14-15 DUP	6B02021-41	Vapor	10	01/29/16 12:46	01/29/16 19:00
AMBIENT AIR	6B02021-42	Vapor	10	01/29/16 12:52	01/29/16 19:00
SVM-16-16 R2	6B02021-43	Vapor	10	01/29/16 16:15	01/29/16 19:00
SVM-16-22 R2	6B02021-44	Vapor	10	01/29/16 16:15	01/29/16 19:00
SVM-6-16 R2	6B02021-45	Vapor	10	01/29/16 17:00	01/29/16 19:00

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LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
			Fixed Gases by TCD					
Oxygen	SVM-1-5	**19**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	SVM-2-5	**19**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	SVM-1-15	**19**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	SVM-15-7	**19**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	SVM-15-15	**19**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	SVM-15-22	**18**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	SVM-6-7	**19**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	SVM-6-16	**19**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	SVM-7-7	**19**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	SVM-7-13	**18**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD

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ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-10-15	**17**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Carbon Dioxide	SVM-10-15	**3.8**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	SVM-3-15	**19**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Carbon Dioxide	SVM-3-15	**0.17**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	SVM-3-5	**18**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	SVM-3-5 DUP	**18**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	SVM-5-15	**19**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	SVM-5-5	**19**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	AMBIENT AIR	**19**	0.10	% by Volume	1	01/27/16	01/27/16	VOCs by GC/TCD
Oxygen	SVM-8-15	**19**	0.10	% by Volume	1	01/28/16	01/28/16	VOCs by GC/TCD
Oxygen	SVM-8-5	**19**	0.10	% by Volume	1	01/28/16	01/28/16	VOCs by GC/TCD

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LABORATORY ANALYSIS RESULTS

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ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-16-7	**19**	0.10	% by Volume	1	01/28/16	01/28/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-7	**0.23**	0.10	% by Volume	1	01/28/16	01/28/16	VOCs by GC/TCD
Oxygen	SVM-16-16	**19**	0.10	% by Volume	1	01/28/16	01/28/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-16	**0.28**	0.10	% by Volume	1	01/28/16	01/28/16	VOCs by GC/TCD
Oxygen	SVM-16-22	**13**	0.10	% by Volume	1	01/28/16	01/28/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-22	**4.2**	0.10	% by Volume	1	01/28/16	01/28/16	VOCs by GC/TCD
Oxygen	SVM-16-22 DUP	**14**	0.10	% by Volume	1	01/28/16	01/28/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-22 DUP	**3.9**	0.10	% by Volume	1	01/28/16	01/28/16	VOCs by GC/TCD
Oxygen	SVM-6-16 RR	**19**	0.10	% by Volume	1	01/28/16	01/28/16	VOCs by GC/TCD
Oxygen	SVM-16-16 RR	**19**	0.10	% by Volume	1	01/28/16	01/28/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-16 RR	**0.47**	0.10	% by Volume	1	01/28/16	01/28/16	VOCs by GC/TCD

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ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-16-22 RR	**19**	0.10	% by Volume	1	01/28/16	01/28/16	VOCs by GC/TCD
Oxygen	SVM-16-22 DUP RR	**19**	0.10	% by Volume	1	01/28/16	01/28/16	VOCs by GC/TCD
Oxygen	SVM-11-7	**18**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Oxygen	SVM-11-21	**19**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-11-21	**0.29**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Oxygen	SVM-11-15	**19**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-11-15	**0.19**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Oxygen	SVM-12-7	**18**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-12-7	**0.24**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Oxygen	SVM-12-22	**14**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-12-22	**3.0**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-12-15	**14**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-12-15	**3.0**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Oxygen	SVM-13-23	**18**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-13-23	**0.85**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Oxygen	SVM-13-7	**19**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Oxygen	SVM-13-15.5	**18**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Oxygen	SVM-14-22	**17**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-14-22	**0.71**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Oxygen	SVM-14-7	**15**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-14-7	**0.14**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Oxygen	SVM-14-15	**14**	0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result		MRL	Units	Dilution	Prepared	Analyzed	Method
Carbon Dioxide	SVM-14-15	**3.6**		0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Oxygen	SVM-14-15 DUP	**14**		0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Carbon Dioxide	SVM-14-15 DUP	**3.5**		0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
Oxygen	AMBIENT AIR	**18**		0.10	% by Volume	1	01/29/16	01/29/16	VOCs by GC/TCD
		VOCs by EPA TO-3							
Gasoline Range Organics (GRO)	SVM-13-23	**1500**		20	ug/L	1	01/29/16	01/29/16	TO-3
Gasoline Range Organics (GRO)	SVM-14-22	**57000**		2000	ug/L	100	01/29/16	01/29/16	TO-3
Gasoline Range Organics (GRO)	SVM-14-7	**890**		20	ug/L	1	01/29/16	01/29/16	TO-3
Gasoline Range Organics (GRO)	SVM-14-15	**570**		20	ug/L	1	01/29/16	01/29/16	TO-3
Gasoline Range Organics (GRO)	SVM-14-15 DUP	**530**		20	ug/L	1	01/29/16	01/29/16	TO-3
		VOCs by GCMS EPA TO-15							
Isopropanol (IPA)	SVM-6-16	**0.91**	**E**	0.20	ug/L	1	01/27/16	01/27/16	TO-15
Chloroform	SVM-3-15	**0.056**		0.020	ug/L	1	01/27/16	01/27/16	TO-15
Ethanol	SVM-5-15	**0.20**		0.020	ug/L	1	01/27/16	01/27/16	TO-15
n-Hexane	SVM-8-15	**0.022**		0.020	ug/L	1	01/28/16	01/28/16	TO-15
Toluene	SVM-8-15	**0.021**		0.020	ug/L	1	01/28/16	01/28/16	TO-15
Isopropanol (IPA)	SVM-16-16	**0.69**	**E**	0.20	ug/L	1	01/28/16	01/28/16	TO-15

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result		MRL	Units	Dilution	Prepared	Analyzed	Method
Isopropanol (IPA)	SVM-16-22	**2.9**	**E**	0.20	ug/L	1	01/28/16	01/28/16	TO-15
Isopropanol (IPA)	SVM-6-16 RR	**0.42**	**E**	0.20	ug/L	1	01/28/16	01/28/16	TO-15
Isopropanol (IPA)	SVM-16-16 RR	**0.48**	**E**	0.20	ug/L	1	01/28/16	01/28/16	TO-15
Isopropanol (IPA)	SVM-16-22 RR	**1.5**	**E**	0.20	ug/L	1	01/28/16	01/28/16	TO-15
Benzene	SVM-13-23	**3.3**		0.40	ug/L	20	01/29/16	01/29/16	TO-15
Ethylbenzene	SVM-13-23	**13**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
Heptane	SVM-13-23	**24**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
n-Hexane	SVM-13-23	**18**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
Toluene	SVM-13-23	**21**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
2,2,4-Trimethylpentane	SVM-13-23	**87**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
m,p-Xylenes	SVM-13-23	**35**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
1,1,1,2-Tetrachloroethane	SVM-13-23	**15**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
Benzene	SVM-14-22	**2200**		200	ug/L	10000	01/29/16	01/29/16	TO-15
Cyclohexane	SVM-14-22	**1700**		200	ug/L	10000	01/29/16	01/29/16	TO-15
Heptane	SVM-14-22	**2500**		200	ug/L	10000	01/29/16	01/29/16	TO-15
n-Hexane	SVM-14-22	**3800**		200	ug/L	10000	01/29/16	01/29/16	TO-15
Toluene	SVM-14-22	**3400**		200	ug/L	10000	01/29/16	01/29/16	TO-15
2,2,4-Trimethylpentane	SVM-14-22	**3500**		200	ug/L	10000	01/29/16	01/29/16	TO-15
o-Xylene	SVM-14-22	**200**		200	ug/L	10000	01/29/16	01/29/16	TO-15
m,p-Xylenes	SVM-14-22	**620**		200	ug/L	10000	01/29/16	01/29/16	TO-15
Heptane	SVM-14-7	**9.4**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
n-Hexane	SVM-14-7	**8.0**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
2,2,4-Trimethylpentane	SVM-14-7	**77**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
Heptane	SVM-14-15	**4.5**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
n-Hexane	SVM-14-15	**4.4**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
2,2,4-Trimethylpentane	SVM-14-15	**44**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
Heptane	SVM-14-15 DUP	**4.4**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
n-Hexane	SVM-14-15 DUP	**4.1**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
2,2,4-Trimethylpentane	SVM-14-15 DUP	**42**		4.0	ug/L	200	01/29/16	01/29/16	TO-15
Benzene	SVM-16-22 R2	**0.070**		0.020	ug/L	1	01/29/16	01/29/16	TO-15
Cyclohexane	SVM-16-22 R2	**0.071**		0.020	ug/L	1	01/29/16	01/29/16	TO-15

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Heptane	SVM-16-22 R2	**0.11**	0.020	ug/L	1	01/29/16	01/29/16	TO-15
n-Hexane	SVM-16-22 R2	**0.18**	0.020	ug/L	1	01/29/16	01/29/16	TO-15
Toluene	SVM-16-22 R2	**0.20**	0.020	ug/L	1	01/29/16	01/29/16	TO-15
2,2,4-Trimethylpentane	SVM-16-22 R2	**0.26**	0.020	ug/L	1	01/29/16	01/29/16	TO-15
o-Xylene	SVM-16-22 R2	**0.021**	0.020	ug/L	1	01/29/16	01/29/16	TO-15
m,p-Xylenes	SVM-16-22 R2	**0.048**	0.020	ug/L	1	01/29/16	01/29/16	TO-15

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-01	6B02021-02	6B02021-03	6B02021-04	
Client ID No:	SVM-1-5	SVM-2-5	SVM-1-15	SVM-15-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	106%	107%	110%	111%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187306
Project No:	496965.A1.01	**Date Received:**	01/29/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	02/12/16
Method:	VOCs by EPA TO-3	**Units:**	ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-05	6B02021-06	6B02021-07	6B02021-08	
Client ID No:	SVM-15-15	SVM-15-22	SVM-6-7	SVM-6-16	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	112%	108%	113%	115%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-09	6B02021-10	6B02021-11	6B02021-12	
Client ID No:	SVM-7-7	SVM-7-13	SVM-10-15	SVM-3-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	112%	116%	118%	108%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-13	6B02021-14	6B02021-15	6B02021-16	
Client ID No:	SVM-3-5	SVM-3-5 DUP	SVM-5-15	SVM-5-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	111%	112%	116%	115%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/2016	01/28/2016	01/28/2016	01/28/2016	
Date Prepared:	01/27/16	01/28/16	01/28/16	01/28/16	
Date Analyzed:	01/27/16	01/28/16	01/28/16	01/28/16	
AA ID No:	6B02021-17	6B02021-18	6B02021-19	6B02021-20	
Client ID No:	AMBIENT AIR	SVM-8-15	SVM-8-5	SVM-16-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	117%	120%	117%	118%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/28/16	01/28/16	01/28/16	01/28/16	
Date Prepared:	01/28/16	01/28/16	01/28/16	01/28/16	
Date Analyzed:	01/28/16	01/28/16	01/28/16	01/28/16	
AA ID No:	6B02021-21	6B02021-22	6B02021-24	6B02021-25	
Client ID No:	SVM-16-16	SVM-16-22	SVM-6-16 RR	SVM-16-16 RR	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	122%	122%	116%	125%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/28/16	01/28/16	01/29/16	01/29/16	
Date Prepared:	01/28/16	01/28/16	01/29/16	01/29/16	
Date Analyzed:	01/28/16	01/28/16	01/29/16	01/29/16	
AA ID No:	6B02021-26	6B02021-28	6B02021-29	6B02021-30	
Client ID No:	SVM-16-22 RR	AMBIENT AIR	SVM-11-7	SVM-11-21	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	132% [1]	133% [1]	114%	120%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-31	6B02021-32	6B02021-33	6B02021-34	
Client ID No:	SVM-11-15	SVM-12-7	SVM-12-22	SVM-12-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	115%	125%	125%	127%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-35	6B02021-36	6B02021-37	6B02021-38	
Client ID No:	SVM-13-23	SVM-13-7	SVM-13-15.5	SVM-14-22	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	100	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	**1500**	<20	<20	**57000**	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	146% [1]	108%	122%	108%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-39	6B02021-40	6B02021-41	6B02021-42	
Client ID No:	SVM-14-7	SVM-14-15	SVM-14-15 DUP	AMBIENT AIR	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	**890**	**570**	**530**	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	132% [1]	135% [1]	126%	127%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-43	6B02021-44	6B02021-45	
Client ID No:	SVM-16-16 R2	SVM-16-22 R2	SVM-6-16 R2	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL
TO-3 (TO-3)				
Gasoline Range Organics (GRO)	<20	<20	<20	20
Surrogates				**%REC Limits**
4-Bromofluorobenzene	127%	114%	130%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-01	6B02021-02	6B02021-03	6B02021-04	
Client ID No:	SVM-1-5	SVM-2-5	SVM-1-15	SVM-15-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-01	6B02021-02	6B02021-03	6B02021-04	
Client ID No:	SVM-1-5	SVM-2-5	SVM-1-15	SVM-15-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-01	6B02021-02	6B02021-03	6B02021-04	
Client ID No:	SVM-1-5	SVM-2-5	SVM-1-15	SVM-15-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	100%	100%	103%	104%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-05	6B02021-06	6B02021-07	6B02021-08	
Client ID No:	SVM-15-15	SVM-15-22	SVM-6-7	SVM-6-16	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-05	6B02021-06	6B02021-07	6B02021-08	
Client ID No:	SVM-15-15	SVM-15-22	SVM-6-7	SVM-6-16	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	**0.91 [2]**	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-05	6B02021-06	6B02021-07	6B02021-08	
Client ID No:	SVM-15-15	SVM-15-22	SVM-6-7	SVM-6-16	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	106%	101%	106%	108%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-09	6B02021-10	6B02021-11	6B02021-12	
Client ID No:	SVM-7-7	SVM-7-13	SVM-10-15	SVM-3-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	**0.056**	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-09	6B02021-10	6B02021-11	6B02021-12	
Client ID No:	SVM-7-7	SVM-7-13	SVM-10-15	SVM-3-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-09	6B02021-10	6B02021-11	6B02021-12	
Client ID No:	SVM-7-7	SVM-7-13	SVM-10-15	SVM-3-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	106%	109%	111%	101%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-13	6B02021-14	6B02021-15	6B02021-16	
Client ID No:	SVM-3-5	SVM-3-5 DUP	SVM-5-15	SVM-5-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-13	6B02021-14	6B02021-15	6B02021-16	
Client ID No:	SVM-3-5	SVM-3-5 DUP	SVM-5-15	SVM-5-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	**0.20**	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-13	6B02021-14	6B02021-15	6B02021-16	
Client ID No:	SVM-3-5	SVM-3-5 DUP	SVM-5-15	SVM-5-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	105%	105%	109%	108%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187306
Project No:	496965.A1.01	**Date Received:**	01/29/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	02/12/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	01/27/2016	01/28/2016	01/28/2016	01/28/2016	
Date Prepared:	01/27/16	01/28/16	01/28/16	01/28/16	
Date Analyzed:	01/27/16	01/28/16	01/28/16	01/28/16	
AA ID No:	6B02021-17	6B02021-18	6B02021-19	6B02021-20	
Client ID No:	AMBIENT AIR	SVM-8-15	SVM-8-5	SVM-16-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/2016	01/28/2016	01/28/2016	01/28/2016	
Date Prepared:	01/27/16	01/28/16	01/28/16	01/28/16	
Date Analyzed:	01/27/16	01/28/16	01/28/16	01/28/16	
AA ID No:	6B02021-17	6B02021-18	6B02021-19	6B02021-20	
Client ID No:	AMBIENT AIR	SVM-8-15	SVM-8-5	SVM-16-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	**0.022**	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/27/2016	01/28/2016	01/28/2016	01/28/2016	
Date Prepared:	01/27/16	01/28/16	01/28/16	01/28/16	
Date Analyzed:	01/27/16	01/28/16	01/28/16	01/28/16	
AA ID No:	6B02021-17	6B02021-18	6B02021-19	6B02021-20	
Client ID No:	AMBIENT AIR	SVM-8-15	SVM-8-5	SVM-16-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	**0.021**	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	110%	113%	110%	111%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187306
Project No:	496965.A1.01	**Date Received:**	01/29/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	02/12/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	01/28/16	01/28/16	01/28/16	01/28/16	
Date Prepared:	01/28/16	01/28/16	01/28/16	01/28/16	
Date Analyzed:	01/28/16	01/28/16	01/28/16	01/28/16	
AA ID No:	6B02021-21	6B02021-22	6B02021-24	6B02021-25	
Client ID No:	SVM-16-16	SVM-16-22	SVM-6-16 RR	SVM-16-16 RR	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187306
Project No:	496965.A1.01	**Date Received:**	01/29/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	02/12/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	01/28/16	01/28/16	01/28/16	01/28/16	
Date Prepared:	01/28/16	01/28/16	01/28/16	01/28/16	
Date Analyzed:	01/28/16	01/28/16	01/28/16	01/28/16	
AA ID No:	6B02021-21	6B02021-22	6B02021-24	6B02021-25	
Client ID No:	SVM-16-16	SVM-16-22	SVM-6-16 RR	SVM-16-16 RR	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	**0.69 [2]**	**2.9 [2]**	**0.42 [2]**	**0.48 [2]**	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/28/16	01/28/16	01/28/16	01/28/16	
Date Prepared:	01/28/16	01/28/16	01/28/16	01/28/16	
Date Analyzed:	01/28/16	01/28/16	01/28/16	01/28/16	
AA ID No:	6B02021-21	6B02021-22	6B02021-24	6B02021-25	
Client ID No:	SVM-16-16	SVM-16-22	SVM-6-16 RR	SVM-16-16 RR	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	115%	116%	109%	118%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187306
Project No:	496965.A1.01	**Date Received:**	01/29/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	02/12/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	01/28/16	01/28/16	01/29/16	01/29/16	
Date Prepared:	01/28/16	01/28/16	01/29/16	01/29/16	
Date Analyzed:	01/28/16	01/28/16	01/29/16	01/29/16	
AA ID No:	6B02021-26	6B02021-28	6B02021-29	6B02021-30	
Client ID No:	SVM-16-22 RR	AMBIENT AIR	SVM-11-7	SVM-11-21	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/28/16	01/28/16	01/29/16	01/29/16	
Date Prepared:	01/28/16	01/28/16	01/29/16	01/29/16	
Date Analyzed:	01/28/16	01/28/16	01/29/16	01/29/16	
AA ID No:	6B02021-26	6B02021-28	6B02021-29	6B02021-30	
Client ID No:	SVM-16-22 RR	AMBIENT AIR	SVM-11-7	SVM-11-21	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	**1.5 [2]**	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/28/16	01/28/16	01/29/16	01/29/16	
Date Prepared:	01/28/16	01/28/16	01/29/16	01/29/16	
Date Analyzed:	01/28/16	01/28/16	01/29/16	01/29/16	
AA ID No:	6B02021-26	6B02021-28	6B02021-29	6B02021-30	
Client ID No:	SVM-16-22 RR	AMBIENT AIR	SVM-11-7	SVM-11-21	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	124%	125%	108%	112%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-31	6B02021-32	6B02021-33	6B02021-34	
Client ID No:	SVM-11-15	SVM-12-7	SVM-12-22	SVM-12-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-31	6B02021-32	6B02021-33	6B02021-34	
Client ID No:	SVM-11-15	SVM-12-7	SVM-12-22	SVM-12-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-31	6B02021-32	6B02021-33	6B02021-34	
Client ID No:	SVM-11-15	SVM-12-7	SVM-12-22	SVM-12-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	108%	117%	118%	119%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-35	6B02021-36	6B02021-37	6B02021-38	
Client ID No:	SVM-13-23	SVM-13-7	SVM-13-15.5	SVM-14-22	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	20	1	1	10000	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<4.0	<0.020	<0.020	<200	0.020
Allyl chloride	<4.0	<0.020	<0.020	<200	0.020
tert-Amyl Methyl Ether (TAME)	<4.0	<0.020	<0.020	<200	0.020
Benzene	**3.3**	<0.020	<0.020	**2200**	0.020
Benzyl chloride	<4.0	<0.020	<0.020	<200	0.020
Bromodichloromethane	<4.0	<0.020	<0.020	<200	0.020
Bromoform	<4.0	<0.020	<0.020	<200	0.020
Bromomethane	<4.0	<0.020	<0.020	<200	0.020
1,3-Butadiene	<4.0	<0.020	<0.020	<200	0.020
2-Butanone (MEK)	<4.0	<0.020	<0.020	<200	0.020
tert-Butyl alcohol (TBA)	<4000	<20	<20	<200000	20
Carbon Disulfide	<4.0	<0.020	<0.020	<200	0.020
Carbon Tetrachloride	<4.0	<0.020	<0.020	<200	0.020
Chlorobenzene	<4.0	<0.020	<0.020	<200	0.020
Chloroethane	<4.0	<0.020	<0.020	<200	0.020
Chloroform	<4.0	<0.020	<0.020	<200	0.020
Chloromethane	<4.0	<0.020	<0.020	<200	0.020
Cyclohexane	<4.0	<0.020	<0.020	**1700**	0.020
Dibromochloromethane	<4.0	<0.020	<0.020	<200	0.020
1,2-Dibromoethane (EDB)	<4.0	<0.020	<0.020	<200	0.020
1,2-Dichlorobenzene	<4.0	<0.020	<0.020	<200	0.020
1,3-Dichlorobenzene	<4.0	<0.020	<0.020	<200	0.020
1,4-Dichlorobenzene	<4.0	<0.020	<0.020	<200	0.020
Dichlorodifluoromethane (R12)	<4.0	<0.020	<0.020	<200	0.020
1,1-Dichloroethane	<4.0	<0.020	<0.020	<200	0.020
1,2-Dichloroethane (EDC)	<4.0	<0.020	<0.020	<200	0.020
cis-1,2-Dichloroethylene	<4.0	<0.020	<0.020	<200	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-35	6B02021-36	6B02021-37	6B02021-38	
Client ID No:	SVM-13-23	SVM-13-7	SVM-13-15.5	SVM-14-22	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	20	1	1	10000	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<4.0	<0.020	<0.020	<200	0.020
trans-1,2-Dichloroethylene	<4.0	<0.020	<0.020	<200	0.020
1,2-Dichloropropane	<4.0	<0.020	<0.020	<200	0.020
trans-1,3-Dichloropropylene	<4.0	<0.020	<0.020	<200	0.020
cis-1,3-Dichloropropylene	<4.0	<0.020	<0.020	<200	0.020
Dichlorotetrafluoroethane	<4.0	<0.020	<0.020	<200	0.020
Diisopropyl ether (DIPE)	<4.0	<0.020	<0.020	<200	0.020
1,4-Dioxane	<4.0	<0.020	<0.020	<200	0.020
Ethanol	<4.0	<0.020	<0.020	<200	0.020
Ethyl Acetate	<4.0	<0.020	<0.020	<200	0.020
Ethylbenzene	**13**	<0.020	<0.020	<200	0.020
Ethyl-tert-Butyl Ether (ETBE)	<4.0	<0.020	<0.020	<200	0.020
4-Ethyltoluene	<4.0	<0.020	<0.020	<200	0.020
Heptane	**24**	<0.020	<0.020	**2500**	0.020
Hexachlorobutadiene	<4.0	<0.020	<0.020	<200	0.020
n-Hexane	**18**	<0.020	<0.020	**3800**	0.020
2-Hexanone (MBK)	<4.0	<0.020	<0.020	<200	0.020
Isopropanol (IPA)	<40	<0.20	<0.20	<2000	0.20
Methyl-tert-Butyl Ether (MTBE)	<4.0	<0.020	<0.020	<200	0.020
Methylene Chloride	<4.0	<0.020	<0.020	<200	0.020
4-Methyl-2-pentanone (MIBK)	<4.0	<0.020	<0.020	<200	0.020
Naphthalene	<4.0	<0.020	<0.020	<200	0.020
Propylene	<4.0	<0.020	<0.020	<200	0.020
Styrene	<4.0	<0.020	<0.020	<200	0.020
1,1,2,2-Tetrachloroethane	<4.0	<0.020	<0.020	<200	0.020
Tetrachloroethylene (PCE)	<4.0	<0.020	<0.020	<200	0.020
Tetrahydrofuran (THF)	<4.0	<0.020	<0.020	<200	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-35	6B02021-36	6B02021-37	6B02021-38	
Client ID No:	SVM-13-23	SVM-13-7	SVM-13-15.5	SVM-14-22	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	20	1	1	10000	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	**21**	<0.020	<0.020	**3400**	0.020
1,2,4-Trichlorobenzene	<4.0	<0.020	<0.020	<200	0.020
1,1,2-Trichloroethane	<4.0	<0.020	<0.020	<200	0.020
1,1,1-Trichloroethane	<4.0	<0.020	<0.020	<200	0.020
Trichloroethylene (TCE)	<4.0	<0.020	<0.020	<200	0.020
Trichlorofluoromethane (R11)	<4.0	<0.020	<0.020	<200	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<4.0	<0.020	<0.020	<200	0.020
1,3,5-Trimethylbenzene	<4.0	<0.020	<0.020	<200	0.020
1,2,4-Trimethylbenzene	<4.0	<0.020	<0.020	<200	0.020
2,2,4-Trimethylpentane	**87**	<0.020	<0.020	**3500**	0.020
Vinyl acetate	<4.0	<0.020	<0.020	<200	0.020
Vinyl bromide	<4.0	<0.020	<0.020	<200	0.020
Vinyl chloride	<4.0	<0.020	<0.020	<200	0.020
o-Xylene	<4.0	<0.020	<0.020	**200**	0.020
m,p-Xylenes	**35**	<0.020	<0.020	**620**	0.020
1,1,1,2-Tetrachloroethane	**15**	<0.020	<0.020	<200	0.020
1,2,3-Trichloropropane	<4.0	<0.020	<0.020	<200	0.020
sec-Butylbenzene	<4.0	<0.020	<0.020	<200	0.020
Isopropylbenzene	<4.0	<0.020	<0.020	<200	0.020
n-Propylbenzene	<4.0	<0.020	<0.020	<200	0.020
4-Isopropyltoluene	<4.0	<0.020	<0.020	<200	0.020
n-Butylbenzene	<4.0	<0.020	<0.020	<200	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	137%	102%	115%	102%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-39	6B02021-40	6B02021-41	6B02021-42	
Client ID No:	SVM-14-7	SVM-14-15	SVM-14-15 DUP	AMBIENT AIR	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	200	200	200	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<4.0	<4.0	<4.0	<0.020	0.020
Allyl chloride	<4.0	<4.0	<4.0	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<4.0	<4.0	<4.0	<0.020	0.020
Benzene	<4.0	<4.0	<4.0	<0.020	0.020
Benzyl chloride	<4.0	<4.0	<4.0	<0.020	0.020
Bromodichloromethane	<4.0	<4.0	<4.0	<0.020	0.020
Bromoform	<4.0	<4.0	<4.0	<0.020	0.020
Bromomethane	<4.0	<4.0	<4.0	<0.020	0.020
1,3-Butadiene	<4.0	<4.0	<4.0	<0.020	0.020
2-Butanone (MEK)	<4.0	<4.0	<4.0	<0.020	0.020
tert-Butyl alcohol (TBA)	<4000	<4000	<4000	<20	20
Carbon Disulfide	<4.0	<4.0	<4.0	<0.020	0.020
Carbon Tetrachloride	<4.0	<4.0	<4.0	<0.020	0.020
Chlorobenzene	<4.0	<4.0	<4.0	<0.020	0.020
Chloroethane	<4.0	<4.0	<4.0	<0.020	0.020
Chloroform	<4.0	<4.0	<4.0	<0.020	0.020
Chloromethane	<4.0	<4.0	<4.0	<0.020	0.020
Cyclohexane	<4.0	<4.0	<4.0	<0.020	0.020
Dibromochloromethane	<4.0	<4.0	<4.0	<0.020	0.020
1,2-Dibromoethane (EDB)	<4.0	<4.0	<4.0	<0.020	0.020
1,2-Dichlorobenzene	<4.0	<4.0	<4.0	<0.020	0.020
1,3-Dichlorobenzene	<4.0	<4.0	<4.0	<0.020	0.020
1,4-Dichlorobenzene	<4.0	<4.0	<4.0	<0.020	0.020
Dichlorodifluoromethane (R12)	<4.0	<4.0	<4.0	<0.020	0.020
1,1-Dichloroethane	<4.0	<4.0	<4.0	<0.020	0.020
1,2-Dichloroethane (EDC)	<4.0	<4.0	<4.0	<0.020	0.020
cis-1,2-Dichloroethylene	<4.0	<4.0	<4.0	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-39	6B02021-40	6B02021-41	6B02021-42	
Client ID No:	SVM-14-7	SVM-14-15	SVM-14-15 DUP	AMBIENT AIR	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	200	200	200	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<4.0	<4.0	<4.0	<0.020	0.020
trans-1,2-Dichloroethylene	<4.0	<4.0	<4.0	<0.020	0.020
1,2-Dichloropropane	<4.0	<4.0	<4.0	<0.020	0.020
trans-1,3-Dichloropropylene	<4.0	<4.0	<4.0	<0.020	0.020
cis-1,3-Dichloropropylene	<4.0	<4.0	<4.0	<0.020	0.020
Dichlorotetrafluoroethane	<4.0	<4.0	<4.0	<0.020	0.020
Diisopropyl ether (DIPE)	<4.0	<4.0	<4.0	<0.020	0.020
1,4-Dioxane	<4.0	<4.0	<4.0	<0.020	0.020
Ethanol	<4.0	<4.0	<4.0	<0.020	0.020
Ethyl Acetate	<4.0	<4.0	<4.0	<0.020	0.020
Ethylbenzene	<4.0	<4.0	<4.0	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<4.0	<4.0	<4.0	<0.020	0.020
4-Ethyltoluene	<4.0	<4.0	<4.0	<0.020	0.020
Heptane	**9.4**	**4.5**	**4.4**	<0.020	0.020
Hexachlorobutadiene	<4.0	<4.0	<4.0	<0.020	0.020
n-Hexane	**8.0**	**4.4**	**4.1**	<0.020	0.020
2-Hexanone (MBK)	<4.0	<4.0	<4.0	<0.020	0.020
Isopropanol (IPA)	<40	<40	<40	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<4.0	<4.0	<4.0	<0.020	0.020
Methylene Chloride	<4.0	<4.0	<4.0	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<4.0	<4.0	<4.0	<0.020	0.020
Naphthalene	<4.0	<4.0	<4.0	<0.020	0.020
Propylene	<4.0	<4.0	<4.0	<0.020	0.020
Styrene	<4.0	<4.0	<4.0	<0.020	0.020
1,1,2,2-Tetrachloroethane	<4.0	<4.0	<4.0	<0.020	0.020
Tetrachloroethylene (PCE)	<4.0	<4.0	<4.0	<0.020	0.020
Tetrahydrofuran (THF)	<4.0	<4.0	<4.0	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-39	6B02021-40	6B02021-41	6B02021-42	
Client ID No:	SVM-14-7	SVM-14-15	SVM-14-15 DUP	AMBIENT AIR	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	200	200	200	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<4.0	<4.0	<4.0	<0.020	0.020
1,2,4-Trichlorobenzene	<4.0	<4.0	<4.0	<0.020	0.020
1,1,2-Trichloroethane	<4.0	<4.0	<4.0	<0.020	0.020
1,1,1-Trichloroethane	<4.0	<4.0	<4.0	<0.020	0.020
Trichloroethylene (TCE)	<4.0	<4.0	<4.0	<0.020	0.020
Trichlorofluoromethane (R11)	<4.0	<4.0	<4.0	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<4.0	<4.0	<4.0	<0.020	0.020
1,3,5-Trimethylbenzene	<4.0	<4.0	<4.0	<0.020	0.020
1,2,4-Trimethylbenzene	<4.0	<4.0	<4.0	<0.020	0.020
2,2,4-Trimethylpentane	**77**	**44**	**42**	<0.020	0.020
Vinyl acetate	<4.0	<4.0	<4.0	<0.020	0.020
Vinyl bromide	<4.0	<4.0	<4.0	<0.020	0.020
Vinyl chloride	<4.0	<4.0	<4.0	<0.020	0.020
o-Xylene	<4.0	<4.0	<4.0	<0.020	0.020
m,p-Xylenes	<4.0	<4.0	<4.0	<0.020	0.020
1,1,1,2-Tetrachloroethane	<4.0	<4.0	<4.0	<0.020	0.020
1,2,3-Trichloropropane	<4.0	<4.0	<4.0	<0.020	0.020
sec-Butylbenzene	<4.0	<4.0	<4.0	<0.020	0.020
Isopropylbenzene	<4.0	<4.0	<4.0	<0.020	0.020
n-Propylbenzene	<4.0	<4.0	<4.0	<0.020	0.020
4-Isopropyltoluene	<4.0	<4.0	<4.0	<0.020	0.020
n-Butylbenzene	<4.0	<4.0	<4.0	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	124%	127%	118%	120%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-43	6B02021-44	6B02021-45	
Client ID No:	SVM-16-16 R2	SVM-16-22 R2	SVM-6-16 R2	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL
TO-15 (Mid Level) (TO-15)				
Acetone	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	**0.070**	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	**0.071**	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-43	6B02021-44	6B02021-45	
Client ID No:	SVM-16-16 R2	SVM-16-22 R2	SVM-6-16 R2	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)				
1,1-Dichloroethylene	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	**0.11**	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	**0.18**	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: ug/L

Date Sampled:	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-43	6B02021-44	6B02021-45	
Client ID No:	SVM-16-16 R2	SVM-16-22 R2	SVM-6-16 R2	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)				
Toluene	<0.020	**0.20**	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	**0.26**	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	**0.021**	<0.020	0.020
m,p-Xylenes	<0.020	**0.048**	<0.020	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	0.020
Surrogates				**%REC Limits**
4-Bromofluorobenzene	123%	107%	123%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: % by Volume

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-01	6B02021-02	6B02021-03	6B02021-04	
Client ID No:	SVM-1-5	SVM-2-5	SVM-1-15	SVM-15-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**19**	**19**	**19**	**19**	0.10
Carbon Dioxide	<0.10	<0.10	<0.10	<0.10	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: % by Volume

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-05	6B02021-06	6B02021-07	6B02021-08	
Client ID No:	SVM-15-15	SVM-15-22	SVM-6-7	SVM-6-16	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**19**	**18**	**19**	**19**	0.10
Carbon Dioxide	<0.10	<0.10	<0.10	<0.10	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: % by Volume

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-09	6B02021-10	6B02021-11	6B02021-12	
Client ID No:	SVM-7-7	SVM-7-13	SVM-10-15	SVM-3-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**19**	**18**	**17**	**19**	0.10
Carbon Dioxide	<0.10	<0.10	**3.8**	**0.17**	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: % by Volume

Date Sampled:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Prepared:	01/27/16	01/27/16	01/27/16	01/27/16	
Date Analyzed:	01/27/16	01/27/16	01/27/16	01/27/16	
AA ID No:	6B02021-13	6B02021-14	6B02021-15	6B02021-16	
Client ID No:	SVM-3-5	SVM-3-5 DUP	SVM-5-15	SVM-5-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**18**	**18**	**19**	**19**	0.10
Carbon Dioxide	<0.10	<0.10	<0.10	<0.10	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187306
Project No:	496965.A1.01	**Date Received:**	01/29/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	02/12/16
Method:	Fixed Gases by TCD	**Units:**	% by Volume

Date Sampled:	01/27/2016	01/28/2016	01/28/2016	01/28/2016	
Date Prepared:	01/27/16	01/28/16	01/28/16	01/28/16	
Date Analyzed:	01/27/16	01/28/16	01/28/16	01/28/16	
AA ID No:	6B02021-17	6B02021-18	6B02021-19	6B02021-20	
Client ID No:	AMBIENT AIR	SVM-8-15	SVM-8-5	SVM-16-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**19**	**19**	**19**	**19**	0.10
Carbon Dioxide	<0.10	<0.10	<0.10	**0.23**	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: % by Volume

Date Sampled:	01/28/16	01/28/16	01/28/16	01/28/16	
Date Prepared:	01/28/16	01/28/16	01/28/16	01/28/16	
Date Analyzed:	01/28/16	01/28/16	01/28/16	01/28/16	
AA ID No:	6B02021-21	6B02021-22	6B02021-23	6B02021-24	
Client ID No:	SVM-16-16	SVM-16-22	SVM-16-22 DUP	SVM-6-16 RR	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**19**	**13**	**14**	**19**	0.10
Carbon Dioxide	**0.28**	**4.2**	**3.9**	<0.10	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: % by Volume

Date Sampled:	01/28/16	01/28/16	01/28/16	01/29/16	
Date Prepared:	01/28/16	01/28/16	01/28/16	01/29/16	
Date Analyzed:	01/28/16	01/28/16	01/28/16	01/29/16	
AA ID No:	6B02021-25	6B02021-26	6B02021-27	6B02021-29	
Client ID No:	SVM-16-16 RR	SVM-16-22 RR	SVM-16-22 DUP RR	SVM-11-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**19**	**19**	**19**	**18**	0.10
Carbon Dioxide	**0.47**	<0.10	<0.10	<0.10	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187306
Project No:	496965.A1.01	**Date Received:**	01/29/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	02/12/16
Method:	Fixed Gases by TCD	**Units:**	% by Volume

Date Sampled:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-30	6B02021-31	6B02021-32	6B02021-33	
Client ID No:	SVM-11-21	SVM-11-15	SVM-12-7	SVM-12-22	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**19**	**19**	**18**	**14**	0.10
Carbon Dioxide	**0.29**	**0.19**	**0.24**	**3.0**	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187306
Project No:	496965.A1.01	**Date Received:**	01/29/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	02/12/16
Method:	Fixed Gases by TCD	**Units:**	% by Volume

Date Sampled:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-34	6B02021-35	6B02021-36	6B02021-37	
Client ID No:	SVM-12-15	SVM-13-23	SVM-13-7	SVM-13-15.5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**14**	**18**	**19**	**18**	0.10
Carbon Dioxide	**3.0**	**0.85**	<0.10	<0.10	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16
Units: % by Volume

Date Sampled:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Prepared:	01/29/16	01/29/16	01/29/16	01/29/16	
Date Analyzed:	01/29/16	01/29/16	01/29/16	01/29/16	
AA ID No:	6B02021-38	6B02021-39	6B02021-40	6B02021-41	
Client ID No:	SVM-14-22	SVM-14-7	SVM-14-15	SVM-14-15 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**17**	**15**	**14**	**14**	0.10
Carbon Dioxide	**0.71**	**0.14**	**3.6**	**3.5**	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187306
Project No:	496965.A1.01	**Date Received:**	01/29/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	02/12/16
Method:	Fixed Gases by TCD	**Units:**	% by Volume

Date Sampled:	01/29/16	
Date Prepared:	01/29/16	
Date Analyzed:	01/29/16	
AA ID No:	6B02021-42	
Client ID No:	AMBIENT AIR	
Matrix:	Vapor	
Dilution Factor:	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)		
Methane	<0.10	0.10
Oxygen	**18**	0.10
Carbon Dioxide	<0.10	0.10

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by EPA TO-3 - Quality Control										
*Batch B6B0236 - *** DEFAULT PREP ****										
Blank (B6B0236-BLK1)				Prepared & Analyzed: 01/27/16						
Gasoline Range Organics (GRO)	<20	20	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.147*		*ug/L*	*0.14*		*103*	*70-130*			
LCS (B6B0236-BS1)				Prepared & Analyzed: 01/27/16						
Gasoline Range Organics (GRO)	**0.675**	20	ug/L	0.82		82.5	70-130			
Surrogate: 4-Bromofluorobenzene	*0.169*		*ug/L*	*0.14*		*118*	*70-130*			
LCS Dup (B6B0236-BSD1)				Prepared & Analyzed: 01/27/16						
Gasoline Range Organics (GRO)	**0.626**	20	ug/L	0.82		76.5	70-130	7.55	30	
Surrogate: 4-Bromofluorobenzene	*0.166*		*ug/L*	*0.14*		*116*	*70-130*			
Duplicate (B6B0236-DUP1)		**Source: 6B02021-13**		Prepared & Analyzed: 01/27/16						
Gasoline Range Organics (GRO)	**<20**	20	ug/L		<20				30	
Surrogate: 4-Bromofluorobenzene	*0.160*		*ug/L*	*0.14*		*112*	*70-130*			
*Batch B6B0237 - *** DEFAULT PREP ****										
Blank (B6B0237-BLK1)				Prepared & Analyzed: 01/28/16						
Gasoline Range Organics (GRO)	<20	20	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.163*		*ug/L*	*0.14*		*114*	*70-130*			
LCS (B6B0237-BS1)				Prepared & Analyzed: 01/28/16						
Gasoline Range Organics (GRO)	**0.769**	20	ug/L	0.82		94.0	70-130			
Surrogate: 4-Bromofluorobenzene	*0.176*		*ug/L*	*0.14*		*123*	*70-130*			
LCS Dup (B6B0237-BSD1)				Prepared & Analyzed: 01/28/16						
Gasoline Range Organics (GRO)	**0.736**	20	ug/L	0.82		90.0	70-130	4.35	30	
Surrogate: 4-Bromofluorobenzene	*0.174*		*ug/L*	*0.14*		*121*	*70-130*			
*Batch B6B0238 - *** DEFAULT PREP ****										
Blank (B6B0238-BLK1)				Prepared & Analyzed: 01/29/16						
Gasoline Range Organics (GRO)	<20	20	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.167*		*ug/L*	*0.14*		*117*	*70-130*			
LCS (B6B0238-BS1)				Prepared & Analyzed: 01/29/16						
Gasoline Range Organics (GRO)	**0.830**	20	ug/L	0.82		102	70-130			

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by EPA TO-3 - Quality Control										
*Batch B6B0238 - *** DEFAULT PREP ****										
LCS (B6B0238-BS1) Continued				Prepared & Analyzed: 01/29/16						
Surrogate: 4-Bromofluorobenzene	*0.187*		*ug/L*	*0.14*		*130*	*70-130*			
LCS Dup (B6B0238-BSD1)				Prepared & Analyzed: 01/29/16						
Gasoline Range Organics (GRO)	**0.777**	20	ug/L	0.82		95.0	70-130	6.62	30	
Surrogate: 4-Bromofluorobenzene	*0.185*		*ug/L*	*0.14*		*129*	*70-130*			
Duplicate (B6B0238-DUP1)			**Source: 6B02021-40**	Prepared & Analyzed: 01/29/16						
Gasoline Range Organics (GRO)	**532**	20	ug/L		573			7.41	30	
Surrogate: 4-Bromofluorobenzene	*0.180*		*ug/L*	*0.14*		*126*	*70-130*			
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0231 - *** DEFAULT PREP ****										
Blank (B6B0231-BLK1)				Prepared & Analyzed: 01/27/16						
Acetone	<0.020	0.020	ug/L							
Allyl chloride	<0.020	0.020	ug/L							
tert-Amyl Methyl Ether (TAME)	<0.020	0.020	ug/L							
Benzene	<0.020	0.020	ug/L							
Benzyl chloride	<0.020	0.020	ug/L							
Bromodichloromethane	<0.020	0.020	ug/L							
Bromoform	<0.020	0.020	ug/L							
Bromomethane	<0.020	0.020	ug/L							
1,3-Butadiene	<0.020	0.020	ug/L							
2-Butanone (MEK)	<0.020	0.020	ug/L							
tert-Butyl alcohol (TBA)	<20	20	ug/L							
Carbon Disulfide	<0.020	0.020	ug/L							
Carbon Tetrachloride	<0.020	0.020	ug/L							
Chlorobenzene	<0.020	0.020	ug/L							
Chloroethane	<0.020	0.020	ug/L							
Chloroform	<0.020	0.020	ug/L							
Chloromethane	<0.020	0.020	ug/L							
Cyclohexane	<0.020	0.020	ug/L							
Dibromochloromethane	<0.020	0.020	ug/L							
1,2-Dibromoethane (EDB)	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0231 - *** DEFAULT PREP ****										
Blank (B6B0231-BLK1) Continued				Prepared & Analyzed: 01/27/16						
1,2-Dichlorobenzene	<0.020	0.020	ug/L							
1,3-Dichlorobenzene	<0.020	0.020	ug/L							
1,4-Dichlorobenzene	<0.020	0.020	ug/L							
Dichlorodifluoromethane (R12)	<0.020	0.020	ug/L							
1,1-Dichloroethane	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							
cis-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,1-Dichloroethylene	<0.020	0.020	ug/L							
trans-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,2-Dichloropropane	<0.020	0.020	ug/L							
trans-1,3-Dichloropropylene	<0.020	0.020	ug/L							
cis-1,3-Dichloropropylene	<0.020	0.020	ug/L							
Dichlorotetrafluoroethane	<0.020	0.020	ug/L							
Diisopropyl ether (DIPE)	<0.020	0.020	ug/L							
1,4-Dioxane	<0.020	0.020	ug/L							
Ethanol	<0.020	0.020	ug/L							
Ethyl Acetate	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Ethyl-tert-Butyl Ether (ETBE)	<0.020	0.020	ug/L							
4-Ethyltoluene	<0.020	0.020	ug/L							
Heptane	<0.020	0.020	ug/L							
Hexachlorobutadiene	<0.020	0.020	ug/L							
n-Hexane	<0.020	0.020	ug/L							
2-Hexanone (MBK)	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.20	0.20	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<0.020	0.020	ug/L							
Methylene Chloride	<0.020	0.020	ug/L							
4-Methyl-2-pentanone (MIBK)	<0.020	0.020	ug/L							
Naphthalene	<0.020	0.020	ug/L							
Propylene	<0.020	0.020	ug/L							
Styrene	<0.020	0.020	ug/L							
1,1,2,2-Tetrachloroethane	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0231 - *** DEFAULT PREP ****										
Blank (B6B0231-BLK1) Continued				Prepared & Analyzed: 01/27/16						
Tetrachloroethylene (PCE)	<0.020	0.020	ug/L							
Tetrahydrofuran (THF)	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,2,4-Trichlorobenzene	<0.020	0.020	ug/L							
1,1,2-Trichloroethane	<0.020	0.020	ug/L							
1,1,1-Trichloroethane	<0.020	0.020	ug/L							
Trichloroethylene (TCE)	<0.020	0.020	ug/L							
Trichlorofluoromethane (R11)	<0.020	0.020	ug/L							
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	0.020	ug/L							
1,3,5-Trimethylbenzene	<0.020	0.020	ug/L							
1,2,4-Trimethylbenzene	<0.020	0.020	ug/L							
2,2,4-Trimethylpentane	<0.020	0.020	ug/L							
Vinyl acetate	<0.020	0.020	ug/L							
Vinyl bromide	<0.020	0.020	ug/L							
Vinyl chloride	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							
m,p-Xylenes	<0.020	0.020	ug/L							
1,1,1,2-Tetrachloroethane	<0.020	0.020	ug/L							
1,2,3-Trichloropropane	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
4-Isopropyltoluene	<0.020	0.020	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.157*		*ug/L*	*0.14*		*110*	*70-130*			
LCS (B6B0231-BS1)				Prepared & Analyzed: 01/27/16						
Acetone	**0.0226**	0.020	ug/L	0.024		95.2	70-130		30	
Benzene	**0.0271**	0.020	ug/L	0.032		84.7	70-130		30	
Benzyl chloride	**0.0419**	0.020	ug/L	0.052		80.9	70-130		30	
Bromodichloromethane	**0.0580**	0.020	ug/L	0.067		86.5	70-130		30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0231 - *** DEFAULT PREP ****										
LCS (B6B0231-BS1) Continued				Prepared & Analyzed: 01/27/16						
Bromoform	**0.0893**	0.020	ug/L	0.10		86.4	70-130		30	
Bromomethane	**0.0389**	0.020	ug/L	0.039		100	70-130		30	
2-Butanone (MEK)	**0.0247**	0.020	ug/L	0.029		83.9	70-130		30	
Carbon Disulfide	**0.0328**	0.020	ug/L	0.031		105	70-130		30	
Carbon Tetrachloride	**0.0589**	0.020	ug/L	0.063		93.6	70-130		30	
Chlorobenzene	**0.0388**	0.020	ug/L	0.046		84.3	70-130		30	
Chloroethane	**0.0282**	0.020	ug/L	0.026		107	70-130		30	
Chloroform	**0.0411**	0.020	ug/L	0.049		84.1	70-130		30	
Chloromethane	**0.0221**	0.020	ug/L	0.021		107	70-130		30	
Dibromochloromethane	**0.0745**	0.020	ug/L	0.085		87.4	70-130		30	
1,2-Dibromoethane (EDB)	**0.0607**	0.020	ug/L	0.077		79.0	70-130		30	
1,2-Dichlorobenzene	**0.0480**	0.020	ug/L	0.060		79.8	70-130		30	
1,3-Dichlorobenzene	**0.0492**	0.020	ug/L	0.060		81.9	70-130		30	
1,4-Dichlorobenzene	**0.0477**	0.020	ug/L	0.060		79.4	70-130		30	
Dichlorodifluoromethane (R12)	**0.0407**	0.020	ug/L	0.049		82.3	70-130		30	
1,1-Dichloroethane	**0.0367**	0.020	ug/L	0.040		90.7	70-130		30	
1,2-Dichloroethane (EDC)	**0.0359**	0.020	ug/L	0.040		88.8	70-130		30	
cis-1,2-Dichloroethylene	**0.0343**	0.020	ug/L	0.040		86.5	70-130		30	
1,1-Dichloroethylene	**0.0397**	0.020	ug/L	0.040		100	70-130		30	
trans-1,2-Dichloroethylene	**0.0374**	0.020	ug/L	0.040		94.3	70-130		30	
1,2-Dichloropropane	**0.0401**	0.020	ug/L	0.046		86.8	70-130		30	
trans-1,3-Dichloropropylene	**0.0382**	0.020	ug/L	0.045		84.2	70-130		30	
cis-1,3-Dichloropropylene	**0.0387**	0.020	ug/L	0.045		85.3	70-130		30	
Dichlorotetrafluoroethane	**0.0731**	0.020	ug/L	0.070		105	70-130		30	
Ethylbenzene	**0.0351**	0.020	ug/L	0.043		80.8	70-130		30	
4-Ethyltoluene	**0.0407**	0.020	ug/L	0.049		82.7	70-130		30	
Hexachlorobutadiene	**0.0934**	0.020	ug/L	0.11		87.6	70-130		30	
2-Hexanone (MBK)	**0.0352**	0.020	ug/L	0.041		86.0	70-130		30	
Isopropanol (IPA)	**0.0230**	0.20	ug/L	0.025		93.7	70-130		30	
Methylene Chloride	**0.0311**	0.020	ug/L	0.035		89.4	70-130		30	
4-Methyl-2-pentanone (MIBK)	**0.0370**	0.020	ug/L	0.041		90.2	70-130		30	
Styrene	**0.0335**	0.020	ug/L	0.043		78.6	70-130		30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0231 - *** DEFAULT PREP ****										
LCS (B6B0231-BS1) Continued				Prepared & Analyzed: 01/27/16						
1,1,2,2-Tetrachloroethane	**0.0557**	0.020	ug/L	0.069		81.1	70-130		30	
Tetrachloroethylene (PCE)	**0.0534**	0.020	ug/L	0.068		78.7	70-130		30	
Toluene	**0.0309**	0.020	ug/L	0.038		82.1	70-130		30	
1,2,4-Trichlorobenzene	**0.0593**	0.020	ug/L	0.074		79.9	70-130		30	
1,1,2-Trichloroethane	**0.0443**	0.020	ug/L	0.055		81.1	70-130		30	
1,1,1-Trichloroethane	**0.0474**	0.020	ug/L	0.055		86.9	70-130		30	
Trichloroethylene (TCE)	**0.0459**	0.020	ug/L	0.054		85.4	70-130		30	
Trichlorofluoromethane (R11)	**0.0553**	0.020	ug/L	0.056		98.4	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0782**	0.020	ug/L	0.077		102	70-130		30	
1,3,5-Trimethylbenzene	**0.0399**	0.020	ug/L	0.049		81.1	70-130		30	
1,2,4-Trimethylbenzene	**0.0398**	0.020	ug/L	0.049		81.0	70-130		30	
Vinyl acetate	**0.0314**	0.020	ug/L	0.035		89.3	70-130		30	
Vinyl chloride	**0.0261**	0.020	ug/L	0.026		102	70-130		30	
o-Xylene	**0.0357**	0.020	ug/L	0.043		82.2	70-130		30	
m,p-Xylenes	**0.0703**	0.020	ug/L	0.087		81.0	70-130		30	
1,2,3-Trichloropropane	**0.0678**	0.020	ug/L	0.060		112	70-130		30	
sec-Butylbenzene	**0.0581**	0.020	ug/L	0.055		106	70-130		30	
Isopropylbenzene	**0.0536**	0.020	ug/L	0.049		109	70-130		30	
n-Propylbenzene	**0.0524**	0.020	ug/L	0.049		107	70-130		30	
4-Isopropyltoluene	**0.0576**	0.020	ug/L	0.055		105	70-130		30	
Surrogate: 4-Bromofluorobenzene	*0.148*		*ug/L*	*0.14*		*104*	*70-130*			
LCS Dup (B6B0231-BSD1)				Prepared & Analyzed: 01/27/16						
Acetone	**0.0224**	0.020	ug/L	0.024		94.2	70-130	1.06	30	
Benzene	**0.0256**	0.020	ug/L	0.032		80.1	70-130	5.58	30	
Benzyl chloride	**0.0387**	0.020	ug/L	0.052		74.8	70-130	7.84	30	
Bromodichloromethane	**0.0569**	0.020	ug/L	0.067		84.9	70-130	1.87	30	
Bromoform	**0.0816**	0.020	ug/L	0.10		78.9	70-130	9.07	30	
Bromomethane	**0.0362**	0.020	ug/L	0.039		93.1	70-130	7.25	30	
2-Butanone (MEK)	**0.0236**	0.020	ug/L	0.029		79.9	70-130	4.88	30	
Carbon Disulfide	**0.0267**	0.020	ug/L	0.031		85.7	70-130	20.5	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0231 - *** DEFAULT PREP ****										
LCS Dup (B6B0231-BSD1) Continued				Prepared & Analyzed: 01/27/16						
Carbon Tetrachloride	**0.0573**	0.020	ug/L	0.063		91.1	70-130	2.71	30	
Chlorobenzene	**0.0367**	0.020	ug/L	0.046		79.7	70-130	5.61	30	
Chloroethane	**0.0274**	0.020	ug/L	0.026		104	70-130	2.75	30	
Chloroform	**0.0393**	0.020	ug/L	0.049		80.4	70-130	4.50	30	
Chloromethane	**0.0223**	0.020	ug/L	0.021		108	70-130	1.02	30	
Dibromochloromethane	**0.0719**	0.020	ug/L	0.085		84.4	70-130	3.49	30	
1,2-Dibromoethane (EDB)	**0.0582**	0.020	ug/L	0.077		75.8	70-130	4.13	30	
1,2-Dichlorobenzene	**0.0450**	0.020	ug/L	0.060		74.9	70-130	6.33	30	
1,3-Dichlorobenzene	**0.0467**	0.020	ug/L	0.060		77.6	70-130	5.39	30	
1,4-Dichlorobenzene	**0.0448**	0.020	ug/L	0.060		74.5	70-130	6.37	30	
Dichlorodifluoromethane (R12)	**0.0467**	0.020	ug/L	0.049		94.4	70-130	13.7	30	
1,1-Dichloroethane	**0.0348**	0.020	ug/L	0.040		85.9	70-130	5.44	30	
1,2-Dichloroethane (EDC)	**0.0353**	0.020	ug/L	0.040		87.3	70-130	1.70	30	
cis-1,2-Dichloroethylene	**0.0332**	0.020	ug/L	0.040		83.8	70-130	3.17	30	
1,1-Dichloroethylene	**0.0366**	0.020	ug/L	0.040		92.4	70-130	8.00	30	
trans-1,2-Dichloroethylene	**0.0358**	0.020	ug/L	0.040		90.3	70-130	4.33	30	
1,2-Dichloropropane	**0.0394**	0.020	ug/L	0.046		85.2	70-130	1.86	30	
trans-1,3-Dichloropropylene	**0.0365**	0.020	ug/L	0.045		80.4	70-130	4.62	30	
cis-1,3-Dichloropropylene	**0.0369**	0.020	ug/L	0.045		81.4	70-130	4.68	30	
Dichlorotetrafluoroethane	**0.0698**	0.020	ug/L	0.070		99.8	70-130	4.70	30	
Ethylbenzene	**0.0335**	0.020	ug/L	0.043		77.1	70-130	4.69	30	
4-Ethyltoluene	**0.0387**	0.020	ug/L	0.049		78.8	70-130	4.83	30	
Hexachlorobutadiene	**0.0892**	0.020	ug/L	0.11		83.6	70-130	4.67	30	
2-Hexanone (MBK)	**0.0318**	0.020	ug/L	0.041		77.6	70-130	10.3	30	
Isopropanol (IPA)	**0.0240**	0.20	ug/L	0.025		97.7	70-130	4.18	30	
Methylene Chloride	**0.0307**	0.020	ug/L	0.035		88.5	70-130	1.01	30	
4-Methyl-2-pentanone (MIBK)	**0.0349**	0.020	ug/L	0.041		85.3	70-130	5.58	30	
Styrene	**0.0317**	0.020	ug/L	0.043		74.4	70-130	5.49	30	
1,1,2,2-Tetrachloroethane	**0.0530**	0.020	ug/L	0.069		77.2	70-130	4.93	30	
Tetrachloroethylene (PCE)	**0.0533**	0.020	ug/L	0.068		78.6	70-130	0.127	30	
Toluene	**0.0293**	0.020	ug/L	0.038		77.7	70-130	5.51	30	
1,2,4-Trichlorobenzene	**0.0540**	0.020	ug/L	0.074		72.7	70-130	9.44	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0231 - *** DEFAULT PREP ****										
LCS Dup (B6B0231-BSD1) Continued				Prepared & Analyzed: 01/27/16						
1,1,2-Trichloroethane	**0.0429**	0.020	ug/L	0.055		78.6	70-130	3.13	30	
1,1,1-Trichloroethane	**0.0465**	0.020	ug/L	0.055		85.2	70-130	1.98	30	
Trichloroethylene (TCE)	**0.0457**	0.020	ug/L	0.054		85.0	70-130	0.469	30	
Trichlorofluoromethane (R11)	**0.0557**	0.020	ug/L	0.056		99.1	70-130	0.709	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0715**	0.020	ug/L	0.077		93.3	70-130	8.91	30	
1,3,5-Trimethylbenzene	**0.0378**	0.020	ug/L	0.049		76.9	70-130	5.32	30	
1,2,4-Trimethylbenzene	**0.0375**	0.020	ug/L	0.049		76.2	70-130	6.11	30	
Vinyl acetate	**0.0319**	0.020	ug/L	0.035		90.7	70-130	1.56	30	
Vinyl chloride	**0.0259**	0.020	ug/L	0.026		101	70-130	0.689	30	
o-Xylene	**0.0340**	0.020	ug/L	0.043		78.3	70-130	4.86	30	
m,p-Xylenes	**0.0675**	0.020	ug/L	0.087		77.7	70-130	4.10	30	
1,2,3-Trichloropropane	**0.0642**	0.020	ug/L	0.060		106	70-130	5.48	30	
sec-Butylbenzene	**0.0546**	0.020	ug/L	0.055		99.4	70-130	6.24	30	
Isopropylbenzene	**0.0503**	0.020	ug/L	0.049		102	70-130	6.34	30	
n-Propylbenzene	**0.0487**	0.020	ug/L	0.049		99.0	70-130	7.39	30	
4-Isopropyltoluene	**0.0547**	0.020	ug/L	0.055		99.7	70-130	5.18	30	
Surrogate: 4-Bromofluorobenzene	*0.156*		*ug/L*	*0.14*		*109*	*70-130*			
Duplicate (B6B0231-DUP1)		**Source: 6B02021-13**		Prepared & Analyzed: 01/27/16						
Acetone	**<0.020**	0.020	ug/L		<0.020				30	
Allyl chloride	**<0.020**	0.020	ug/L		<0.020				30	
tert-Amyl Methyl Ether (TAME)	**<0.020**	0.020	ug/L		<0.020				30	
Benzene	**<0.020**	0.020	ug/L		<0.020				30	
Benzyl chloride	**<0.020**	0.020	ug/L		<0.020				30	
Bromodichloromethane	**<0.020**	0.020	ug/L		<0.020				30	
Bromoform	**<0.020**	0.020	ug/L		<0.020				30	
Bromomethane	**<0.020**	0.020	ug/L		<0.020				30	
1,3-Butadiene	**<0.020**	0.020	ug/L		<0.020				30	
2-Butanone (MEK)	**<0.020**	0.020	ug/L		<0.020				30	
tert-Butyl alcohol (TBA)	**<20**	20	ug/L		<20				30	
Carbon Disulfide	**<0.020**	0.020	ug/L		<0.020				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0231 - *** DEFAULT PREP ****										
Duplicate (B6B0231-DUP1) Continued	**Source: 6B02021-13**	Prepared & Analyzed: 01/27/16								
Carbon Tetrachloride	**<0.020**	0.020	ug/L		<0.020				30	
Chlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
Chloroethane	**<0.020**	0.020	ug/L		<0.020				30	
Chloroform	**<0.020**	0.020	ug/L		<0.020				30	
Chloromethane	**<0.020**	0.020	ug/L		<0.020				30	
Cyclohexane	**<0.020**	0.020	ug/L		<0.020				30	
Dibromochloromethane	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dibromoethane (EDB)	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,3-Dichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,4-Dichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
Dichlorodifluoromethane (R12)	**<0.020**	0.020	ug/L		<0.020				30	
1,1-Dichloroethane	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dichloroethane (EDC)	**<0.020**	0.020	ug/L		<0.020				30	
cis-1,2-Dichloroethylene	**<0.020**	0.020	ug/L		<0.020				30	
1,1-Dichloroethylene	**<0.020**	0.020	ug/L		<0.020				30	
trans-1,2-Dichloroethylene	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dichloropropane	**<0.020**	0.020	ug/L		<0.020				30	
trans-1,3-Dichloropropylene	**<0.020**	0.020	ug/L		<0.020				30	
cis-1,3-Dichloropropylene	**<0.020**	0.020	ug/L		<0.020				30	
Dichlorotetrafluoroethane	**<0.020**	0.020	ug/L		<0.020				30	
Diisopropyl ether (DIPE)	**<0.020**	0.020	ug/L		<0.020				30	
1,4-Dioxane	**<0.020**	0.020	ug/L		<0.020				30	
Ethanol	**<0.020**	0.020	ug/L		<0.020				30	
Ethyl Acetate	**<0.020**	0.020	ug/L		<0.020				30	
Ethylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
Ethyl-tert-Butyl Ether (ETBE)	**<0.020**	0.020	ug/L		<0.020				30	
4-Ethyltoluene	**<0.020**	0.020	ug/L		<0.020				30	
Heptane	**<0.020**	0.020	ug/L		<0.020				30	
Hexachlorobutadiene	**<0.020**	0.020	ug/L		<0.020				30	
n-Hexane	**<0.020**	0.020	ug/L		<0.020				30	
2-Hexanone (MBK)	**<0.020**	0.020	ug/L		<0.020				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0231 - *** DEFAULT PREP ****										
Duplicate (B6B0231-DUP1) Continued	**Source: 6B02021-13**	Prepared & Analyzed: 01/27/16								
Isopropanol (IPA)	**<0.20**	0.20	ug/L		<0.20				30	
Methyl-tert-Butyl Ether (MTBE)	**<0.020**	0.020	ug/L		<0.020				30	
Methylene Chloride	**<0.020**	0.020	ug/L		<0.020				30	
4-Methyl-2-pentanone (MIBK)	**<0.020**	0.020	ug/L		<0.020				30	
Naphthalene	**<0.020**	0.020	ug/L		<0.020				30	
Propylene	**<0.020**	0.020	ug/L		<0.020				30	
Styrene	**<0.020**	0.020	ug/L		<0.020				30	
1,1,2,2-Tetrachloroethane	**<0.020**	0.020	ug/L		<0.020				30	
Tetrachloroethylene (PCE)	**<0.020**	0.020	ug/L		<0.020				30	
Tetrahydrofuran (THF)	**<0.020**	0.020	ug/L		<0.020				30	
Toluene	**<0.020**	0.020	ug/L		<0.020				30	
1,2,4-Trichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,1,2-Trichloroethane	**<0.020**	0.020	ug/L		<0.020				30	
1,1,1-Trichloroethane	**<0.020**	0.020	ug/L		<0.020				30	
Trichloroethylene (TCE)	**<0.020**	0.020	ug/L		<0.020				30	
Trichlorofluoromethane (R11)	**<0.020**	0.020	ug/L		<0.020				30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**<0.020**	0.020	ug/L		<0.020				30	
1,3,5-Trimethylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,2,4-Trimethylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
2,2,4-Trimethylpentane	**<0.020**	0.020	ug/L		<0.020				30	
Vinyl acetate	**<0.020**	0.020	ug/L		<0.020				30	
Vinyl bromide	**<0.020**	0.020	ug/L		<0.020				30	
Vinyl chloride	**<0.020**	0.020	ug/L		<0.020				30	
o-Xylene	**<0.020**	0.020	ug/L		<0.020				30	
m,p-Xylenes	**<0.020**	0.020	ug/L		<0.020				30	
1,1,1,2-Tetrachloroethane	**<0.020**	0.020	ug/L		<0.020				30	
1,2,3-Trichloropropane	**<0.020**	0.020	ug/L		<0.020				30	
sec-Butylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
Isopropylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
n-Propylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
4-Isopropyltoluene	**<0.020**	0.020	ug/L		<0.020				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0231 - *** DEFAULT PREP ****										
Duplicate (B6B0231-DUP1) Continued	**Source: 6B02021-13**		Prepared & Analyzed: 01/27/16							
n-Butylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
Surrogate: 4-Bromofluorobenzene	*0.150*		*ug/L*	*0.14*		*105*	*70-130*			
*Batch B6B0232 - *** DEFAULT PREP ****										
Blank (B6B0232-BLK1)			Prepared & Analyzed: 01/28/16							
Acetone	<0.020	0.020	ug/L							
Allyl chloride	<0.020	0.020	ug/L							
tert-Amyl Methyl Ether (TAME)	<0.020	0.020	ug/L							
Benzene	<0.020	0.020	ug/L							
Benzyl chloride	<0.020	0.020	ug/L							
Bromodichloromethane	<0.020	0.020	ug/L							
Bromoform	<0.020	0.020	ug/L							
Bromomethane	<0.020	0.020	ug/L							
1,3-Butadiene	<0.020	0.020	ug/L							
2-Butanone (MEK)	<0.020	0.020	ug/L							
tert-Butyl alcohol (TBA)	<20	20	ug/L							
Carbon Disulfide	<0.020	0.020	ug/L							
Carbon Tetrachloride	<0.020	0.020	ug/L							
Chlorobenzene	<0.020	0.020	ug/L							
Chloroethane	<0.020	0.020	ug/L							
Chloroform	<0.020	0.020	ug/L							
Chloromethane	<0.020	0.020	ug/L							
Cyclohexane	<0.020	0.020	ug/L							
Dibromochloromethane	<0.020	0.020	ug/L							
1,2-Dibromoethane (EDB)	<0.020	0.020	ug/L							
1,2-Dichlorobenzene	<0.020	0.020	ug/L							
1,3-Dichlorobenzene	<0.020	0.020	ug/L							
1,4-Dichlorobenzene	<0.020	0.020	ug/L							
Dichlorodifluoromethane (R12)	<0.020	0.020	ug/L							
1,1-Dichloroethane	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							
cis-1,2-Dichloroethylene	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0232 - *** DEFAULT PREP ****										
Blank (B6B0232-BLK1) Continued				Prepared & Analyzed: 01/28/16						
1,1-Dichloroethylene	<0.020	0.020	ug/L							
trans-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,2-Dichloropropane	<0.020	0.020	ug/L							
trans-1,3-Dichloropropylene	<0.020	0.020	ug/L							
cis-1,3-Dichloropropylene	<0.020	0.020	ug/L							
Dichlorotetrafluoroethane	<0.020	0.020	ug/L							
Diisopropyl ether (DIPE)	<0.020	0.020	ug/L							
1,4-Dioxane	<0.020	0.020	ug/L							
Ethanol	<0.020	0.020	ug/L							
Ethyl Acetate	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Ethyl-tert-Butyl Ether (ETBE)	<0.020	0.020	ug/L							
4-Ethyltoluene	<0.020	0.020	ug/L							
Heptane	<0.020	0.020	ug/L							
Hexachlorobutadiene	<0.020	0.020	ug/L							
n-Hexane	<0.020	0.020	ug/L							
2-Hexanone (MBK)	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.20	0.20	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<0.020	0.020	ug/L							
Methylene Chloride	<0.020	0.020	ug/L							
4-Methyl-2-pentanone (MIBK)	<0.020	0.020	ug/L							
Naphthalene	<0.020	0.020	ug/L							
Propylene	<0.020	0.020	ug/L							
Styrene	<0.020	0.020	ug/L							
1,1,2,2-Tetrachloroethane	<0.020	0.020	ug/L							
Tetrachloroethylene (PCE)	<0.020	0.020	ug/L							
Tetrahydrofuran (THF)	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,2,4-Trichlorobenzene	<0.020	0.020	ug/L							
1,1,2-Trichloroethane	<0.020	0.020	ug/L							
1,1,1-Trichloroethane	<0.020	0.020	ug/L							
Trichloroethylene (TCE)	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0232 - *** DEFAULT PREP ****										
Blank (B6B0232-BLK1) Continued				Prepared & Analyzed: 01/28/16						
Trichlorofluoromethane (R11)	<0.020	0.020	ug/L							
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	0.020	ug/L							
1,3,5-Trimethylbenzene	<0.020	0.020	ug/L							
1,2,4-Trimethylbenzene	<0.020	0.020	ug/L							
2,2,4-Trimethylpentane	<0.020	0.020	ug/L							
Vinyl acetate	<0.020	0.020	ug/L							
Vinyl bromide	<0.020	0.020	ug/L							
Vinyl chloride	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							
m,p-Xylenes	<0.020	0.020	ug/L							
1,1,1,2-Tetrachloroethane	<0.020	0.020	ug/L							
1,2,3-Trichloropropane	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
4-Isopropyltoluene	<0.020	0.020	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.153*		*ug/L*	*0.14*		*107*	*70-130*			
LCS (B6B0232-BS1)				Prepared & Analyzed: 01/28/16						
Acetone	**0.0224**	0.020	ug/L	0.024		94.5	70-130		30	
Benzene	**0.0244**	0.020	ug/L	0.032		76.5	70-130		30	
Benzyl chloride	**0.0369**	0.020	ug/L	0.052		71.3	70-130		30	
Bromodichloromethane	**0.0547**	0.020	ug/L	0.067		81.6	70-130		30	
Bromoform	**0.0797**	0.020	ug/L	0.10		77.1	70-130		30	
Bromomethane	**0.0348**	0.020	ug/L	0.039		89.7	70-130		30	
2-Butanone (MEK)	**0.0248**	0.020	ug/L	0.029		84.2	70-130		30	
Carbon Disulfide	**0.0263**	0.020	ug/L	0.031		84.4	70-130		30	
Carbon Tetrachloride	**0.0534**	0.020	ug/L	0.063		84.9	70-130		30	
Chlorobenzene	**0.0350**	0.020	ug/L	0.046		76.1	70-130		30	
Chloroethane	**0.0241**	0.020	ug/L	0.026		91.3	70-130		30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0232 - *** DEFAULT PREP ****										
LCS (B6B0232-BS1) Continued				Prepared & Analyzed: 01/28/16						
Chloroform	**0.0392**	0.020	ug/L	0.049		80.3	70-130		30	
Chloromethane	**0.0203**	0.020	ug/L	0.021		98.3	70-130		30	
Dibromochloromethane	**0.0694**	0.020	ug/L	0.085		81.5	70-130		30	
1,2-Dibromoethane (EDB)	**0.0556**	0.020	ug/L	0.077		72.4	70-130		30	
1,2-Dichlorobenzene	**0.0432**	0.020	ug/L	0.060		71.9	70-130		30	
1,3-Dichlorobenzene	**0.0450**	0.020	ug/L	0.060		74.9	70-130		30	
1,4-Dichlorobenzene	**0.0432**	0.020	ug/L	0.060		71.8	70-130		30	
Dichlorodifluoromethane (R12)	**0.0444**	0.020	ug/L	0.049		89.7	70-130		30	
1,1-Dichloroethane	**0.0326**	0.020	ug/L	0.040		80.5	70-130		30	
1,2-Dichloroethane (EDC)	**0.0330**	0.020	ug/L	0.040		81.6	70-130		30	
cis-1,2-Dichloroethylene	**0.0319**	0.020	ug/L	0.040		80.4	70-130		30	
1,1-Dichloroethylene	**0.0355**	0.020	ug/L	0.040		89.6	70-130		30	
trans-1,2-Dichloroethylene	**0.0336**	0.020	ug/L	0.040		84.8	70-130		30	
1,2-Dichloropropane	**0.0368**	0.020	ug/L	0.046		79.6	70-130		30	
trans-1,3-Dichloropropylene	**0.0346**	0.020	ug/L	0.045		76.3	70-130		30	
cis-1,3-Dichloropropylene	**0.0354**	0.020	ug/L	0.045		78.1	70-130		30	
Dichlorotetrafluoroethane	**0.0662**	0.020	ug/L	0.070		94.7	70-130		30	
Ethylbenzene	**0.0330**	0.020	ug/L	0.043		76.1	70-130		30	
4-Ethyltoluene	**0.0373**	0.020	ug/L	0.049		75.9	70-130		30	
Hexachlorobutadiene	**0.0820**	0.020	ug/L	0.11		76.9	70-130		30	
2-Hexanone (MBK)	**0.0309**	0.020	ug/L	0.041		75.5	70-130		30	
Isopropanol (IPA)	**0.0200**	0.20	ug/L	0.025		81.2	70-130		30	
Methylene Chloride	**0.0288**	0.020	ug/L	0.035		83.0	70-130		30	
4-Methyl-2-pentanone (MIBK)	**0.0329**	0.020	ug/L	0.041		80.3	70-130		30	
Styrene	**0.0308**	0.020	ug/L	0.043		72.3	70-130		30	
1,1,2,2-Tetrachloroethane	**0.0503**	0.020	ug/L	0.069		73.3	70-130		30	
Tetrachloroethylene (PCE)	**0.0499**	0.020	ug/L	0.068		73.6	70-130		30	
Toluene	**0.0291**	0.020	ug/L	0.038		77.3	70-130		30	
1,2,4-Trichlorobenzene	**0.0519**	0.020	ug/L	0.074		70.0	70-130		30	
1,1,2-Trichloroethane	**0.0416**	0.020	ug/L	0.055		76.3	70-130		30	
1,1,1-Trichloroethane	**0.0434**	0.020	ug/L	0.055		79.6	70-130		30	
Trichloroethylene (TCE)	**0.0431**	0.020	ug/L	0.054		80.2	70-130		30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0232 - *** DEFAULT PREP ****										
LCS (B6B0232-BS1) Continued				Prepared & Analyzed: 01/28/16						
Trichlorofluoromethane (R11)	**0.0506**	0.020	ug/L	0.056		90.0	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0667**	0.020	ug/L	0.077		87.0	70-130		30	
1,3,5-Trimethylbenzene	**0.0373**	0.020	ug/L	0.049		75.8	70-130		30	
1,2,4-Trimethylbenzene	**0.0361**	0.020	ug/L	0.049		73.4	70-130		30	
Vinyl acetate	**0.0314**	0.020	ug/L	0.035		89.1	70-130		30	
Vinyl chloride	**0.0236**	0.020	ug/L	0.026		92.4	70-130		30	
o-Xylene	**0.0338**	0.020	ug/L	0.043		77.9	70-130		30	
m,p-Xylenes	**0.0664**	0.020	ug/L	0.087		76.4	70-130		30	
1,2,3-Trichloropropane	**0.0618**	0.020	ug/L	0.060		102	70-130		30	
sec-Butylbenzene	**0.0529**	0.020	ug/L	0.055		96.3	70-130		30	
Isopropylbenzene	**0.0502**	0.020	ug/L	0.049		102	70-130		30	
n-Propylbenzene	**0.0481**	0.020	ug/L	0.049		97.9	70-130		30	
4-Isopropyltoluene	**0.0530**	0.020	ug/L	0.055		96.5	70-130		30	
Surrogate: 4-Bromofluorobenzene	*0.150*		*ug/L*	*0.14*		*105*	*70-130*			
LCS Dup (B6B0232-BSD1)				Prepared & Analyzed: 01/28/16						
Acetone	**0.0202**	0.020	ug/L	0.024		85.1	70-130	10.5	30	
Benzene	**0.0236**	0.020	ug/L	0.032		73.9	70-130	3.46	30	
Benzyl chloride	**0.0363**	0.020	ug/L	0.052		70.2	70-130	1.55	30	
Bromodichloromethane	**0.0525**	0.020	ug/L	0.067		78.4	70-130	4.00	30	
Bromoform	**0.0760**	0.020	ug/L	0.10		73.5	70-130	4.78	30	
Bromomethane	**0.0340**	0.020	ug/L	0.039		87.6	70-130	2.37	30	
2-Butanone (MEK)	**0.0234**	0.020	ug/L	0.029		79.2	70-130	6.12	30	
Carbon Disulfide	**0.0250**	0.020	ug/L	0.031		80.3	70-130	4.98	30	
Carbon Tetrachloride	**0.0522**	0.020	ug/L	0.063		82.9	70-130	2.38	30	
Chlorobenzene	**0.0331**	0.020	ug/L	0.046		71.9	70-130	5.68	30	
Chloroethane	**0.0235**	0.020	ug/L	0.026		88.9	70-130	2.66	30	
Chloroform	**0.0371**	0.020	ug/L	0.049		75.9	70-130	5.63	30	
Chloromethane	**0.0190**	0.020	ug/L	0.021		91.9	70-130	6.73	30	
Dibromochloromethane	**0.0666**	0.020	ug/L	0.085		78.2	70-130	4.13	30	
1,2-Dibromoethane (EDB)	**0.0538**	0.020	ug/L	0.077		70.0	70-130	3.37	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0232 - *** DEFAULT PREP ****										
LCS Dup (B6B0232-BSD1) Continued				Prepared & Analyzed: 01/28/16						
1,2-Dichlorobenzene	**0.0424**	0.020	ug/L	0.060		70.6	70-130	1.82	30	
1,3-Dichlorobenzene	**0.0421**	0.020	ug/L	0.060		70.0	70-130	6.76	30	
1,4-Dichlorobenzene	**0.0424**	0.020	ug/L	0.060		70.5	70-130	1.83	30	
Dichlorodifluoromethane (R12)	**0.0431**	0.020	ug/L	0.049		87.1	70-130	2.94	30	
1,1-Dichloroethane	**0.0323**	0.020	ug/L	0.040		79.8	70-130	0.873	30	
1,2-Dichloroethane (EDC)	**0.0324**	0.020	ug/L	0.040		80.1	70-130	1.86	30	
cis-1,2-Dichloroethylene	**0.0297**	0.020	ug/L	0.040		75.0	70-130	6.95	30	
1,1-Dichloroethylene	**0.0342**	0.020	ug/L	0.040		86.3	70-130	3.75	30	
trans-1,2-Dichloroethylene	**0.0314**	0.020	ug/L	0.040		79.2	70-130	6.83	30	
1,2-Dichloropropane	**0.0363**	0.020	ug/L	0.046		78.6	70-130	1.26	30	
trans-1,3-Dichloropropylene	**0.0341**	0.020	ug/L	0.045		75.2	70-130	1.45	30	
cis-1,3-Dichloropropylene	**0.0341**	0.020	ug/L	0.045		75.2	70-130	3.78	30	
Dichlorotetrafluoroethane	**0.0656**	0.020	ug/L	0.070		93.9	70-130	0.848	30	
Ethylbenzene	**0.0314**	0.020	ug/L	0.043		72.4	70-130	4.98	30	
4-Ethyltoluene	**0.0354**	0.020	ug/L	0.049		72.0	70-130	5.27	30	
Hexachlorobutadiene	**0.0783**	0.020	ug/L	0.11		73.4	70-130	4.66	30	
2-Hexanone (MBK)	**0.0295**	0.020	ug/L	0.041		72.0	70-130	4.75	30	
Isopropanol (IPA)	**0.0208**	0.20	ug/L	0.025		84.7	70-130	4.22	30	
Methylene Chloride	**0.0274**	0.020	ug/L	0.035		79.0	70-130	4.94	30	
4-Methyl-2-pentanone (MIBK)	**0.0317**	0.020	ug/L	0.041		77.3	70-130	3.81	30	
Styrene	**0.0310**	0.020	ug/L	0.043		72.7	70-130	0.552	30	
1,1,2,2-Tetrachloroethane	**0.0487**	0.020	ug/L	0.069		70.9	70-130	3.33	30	
Tetrachloroethylene (PCE)	**0.0489**	0.020	ug/L	0.068		72.1	70-130	2.06	30	
Toluene	**0.0278**	0.020	ug/L	0.038		73.9	70-130	4.50	30	
1,2,4-Trichlorobenzene	**0.0527**	0.020	ug/L	0.074		71.0	70-130	1.42	30	
1,1,2-Trichloroethane	**0.0384**	0.020	ug/L	0.055		70.3	70-130	8.19	30	
1,1,1-Trichloroethane	**0.0429**	0.020	ug/L	0.055		78.7	70-130	1.14	30	
Trichloroethylene (TCE)	**0.0418**	0.020	ug/L	0.054		77.8	70-130	3.04	30	
Trichlorofluoromethane (R11)	**0.0494**	0.020	ug/L	0.056		87.9	70-130	2.36	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0624**	0.020	ug/L	0.077		81.4	70-130	6.65	30	
1,3,5-Trimethylbenzene	**0.0350**	0.020	ug/L	0.049		71.2	70-130	6.26	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0232 - *** DEFAULT PREP ****										
LCS Dup (B6B0232-BSD1) Continued				Prepared & Analyzed: 01/28/16						
1,2,4-Trimethylbenzene	**0.0346**	0.020	ug/L	0.049		70.4	70-130	4.17	30	
Vinyl acetate	**0.0295**	0.020	ug/L	0.035		83.7	70-130	6.25	30	
Vinyl chloride	**0.0245**	0.020	ug/L	0.026		95.8	70-130	3.61	30	
o-Xylene	**0.0318**	0.020	ug/L	0.043		73.3	70-130	6.08	30	
m,p-Xylenes	**0.0622**	0.020	ug/L	0.087		71.6	70-130	6.55	30	
1,2,3-Trichloropropane	**0.0615**	0.020	ug/L	0.060		102	70-130	0.489	30	
sec-Butylbenzene	**0.0503**	0.020	ug/L	0.055		91.7	70-130	4.89	30	
Isopropylbenzene	**0.0478**	0.020	ug/L	0.049		97.3	70-130	4.81	30	
n-Propylbenzene	**0.0457**	0.020	ug/L	0.049		93.0	70-130	5.13	30	
4-Isopropyltoluene	**0.0498**	0.020	ug/L	0.055		90.8	70-130	6.09	30	
Surrogate: 4-Bromofluorobenzene	*0.151*		*ug/L*	*0.14*		*106*	*70-130*			
*Batch B6B0233 - *** DEFAULT PREP ****										
Blank (B6B0233-BLK1)				Prepared & Analyzed: 01/29/16						
Acetone	<0.020	0.020	ug/L							
Allyl chloride	<0.020	0.020	ug/L							
tert-Amyl Methyl Ether (TAME)	<0.020	0.020	ug/L							
Benzene	<0.020	0.020	ug/L							
Benzyl chloride	<0.020	0.020	ug/L							
Bromodichloromethane	<0.020	0.020	ug/L							
Bromoform	<0.020	0.020	ug/L							
Bromomethane	<0.020	0.020	ug/L							
1,3-Butadiene	<0.020	0.020	ug/L							
2-Butanone (MEK)	<0.020	0.020	ug/L							
tert-Butyl alcohol (TBA)	<20	20	ug/L							
Carbon Disulfide	<0.020	0.020	ug/L							
Carbon Tetrachloride	<0.020	0.020	ug/L							
Chlorobenzene	<0.020	0.020	ug/L							
Chloroethane	<0.020	0.020	ug/L							
Chloroform	<0.020	0.020	ug/L							
Chloromethane	<0.020	0.020	ug/L							
Cyclohexane	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0233 - *** DEFAULT PREP ****										
Blank (B6B0233-BLK1) Continued				Prepared & Analyzed: 01/29/16						
Dibromochloromethane	<0.020	0.020	ug/L							
1,2-Dibromoethane (EDB)	<0.020	0.020	ug/L							
1,2-Dichlorobenzene	<0.020	0.020	ug/L							
1,3-Dichlorobenzene	<0.020	0.020	ug/L							
1,4-Dichlorobenzene	<0.020	0.020	ug/L							
Dichlorodifluoromethane (R12)	<0.020	0.020	ug/L							
1,1-Dichloroethane	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							
cis-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,1-Dichloroethylene	<0.020	0.020	ug/L							
trans-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,2-Dichloropropane	<0.020	0.020	ug/L							
trans-1,3-Dichloropropylene	<0.020	0.020	ug/L							
cis-1,3-Dichloropropylene	<0.020	0.020	ug/L							
Dichlorotetrafluoroethane	<0.020	0.020	ug/L							
Diisopropyl ether (DIPE)	<0.020	0.020	ug/L							
1,4-Dioxane	<0.020	0.020	ug/L							
Ethanol	<0.020	0.020	ug/L							
Ethyl Acetate	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Ethyl-tert-Butyl Ether (ETBE)	<0.020	0.020	ug/L							
4-Ethyltoluene	<0.020	0.020	ug/L							
Heptane	<0.020	0.020	ug/L							
Hexachlorobutadiene	<0.020	0.020	ug/L							
n-Hexane	<0.020	0.020	ug/L							
2-Hexanone (MBK)	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.20	0.20	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<0.020	0.020	ug/L							
Methylene Chloride	<0.020	0.020	ug/L							
4-Methyl-2-pentanone (MIBK)	<0.020	0.020	ug/L							
Naphthalene	<0.020	0.020	ug/L							
Propylene	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0233 - *** DEFAULT PREP ****										
Blank (B6B0233-BLK1) Continued				Prepared & Analyzed: 01/29/16						
Styrene	<0.020	0.020	ug/L							
1,1,2,2-Tetrachloroethane	<0.020	0.020	ug/L							
Tetrachloroethylene (PCE)	<0.020	0.020	ug/L							
Tetrahydrofuran (THF)	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,2,4-Trichlorobenzene	<0.020	0.020	ug/L							
1,1,2-Trichloroethane	<0.020	0.020	ug/L							
1,1,1-Trichloroethane	<0.020	0.020	ug/L							
Trichloroethylene (TCE)	<0.020	0.020	ug/L							
Trichlorofluoromethane (R11)	<0.020	0.020	ug/L							
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	0.020	ug/L							
1,3,5-Trimethylbenzene	<0.020	0.020	ug/L							
1,2,4-Trimethylbenzene	<0.020	0.020	ug/L							
2,2,4-Trimethylpentane	<0.020	0.020	ug/L							
Vinyl acetate	<0.020	0.020	ug/L							
Vinyl bromide	<0.020	0.020	ug/L							
Vinyl chloride	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							
m,p-Xylenes	<0.020	0.020	ug/L							
1,1,1,2-Tetrachloroethane	<0.020	0.020	ug/L							
1,2,3-Trichloropropane	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
4-Isopropyltoluene	<0.020	0.020	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.157*		*ug/L*	*0.14*		*110*	*70-130*			
LCS (B6B0233-BS1)				Prepared & Analyzed: 01/29/16						
Acetone	**0.0247**	0.020	ug/L	0.024		104	70-130		30	
Benzene	**0.0276**	0.020	ug/L	0.032		86.4	70-130		30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0233 - *** DEFAULT PREP ****										
LCS (B6B0233-BS1) Continued				Prepared & Analyzed: 01/29/16						
Benzyl chloride	**0.0415**	0.020	ug/L	0.052		80.1	70-130		30	
Bromodichloromethane	**0.0610**	0.020	ug/L	0.067		91.1	70-130		30	
Bromoform	**0.0874**	0.020	ug/L	0.10		84.5	70-130		30	
Bromomethane	**0.0388**	0.020	ug/L	0.039		99.9	70-130		30	
2-Butanone (MEK)	**0.0281**	0.020	ug/L	0.029		95.4	70-130		30	
Carbon Disulfide	**0.0305**	0.020	ug/L	0.031		98.0	70-130		30	
Carbon Tetrachloride	**0.0600**	0.020	ug/L	0.063		95.4	70-130		30	
Chlorobenzene	**0.0376**	0.020	ug/L	0.046		81.6	70-130		30	
Chloroethane	**0.0268**	0.020	ug/L	0.026		102	70-130		30	
Chloroform	**0.0439**	0.020	ug/L	0.049		89.9	70-130		30	
Chloromethane	**0.0228**	0.020	ug/L	0.021		111	70-130		30	
Dibromochloromethane	**0.0767**	0.020	ug/L	0.085		90.0	70-130		30	
1,2-Dibromoethane (EDB)	**0.0625**	0.020	ug/L	0.077		81.4	70-130		30	
1,2-Dichlorobenzene	**0.0468**	0.020	ug/L	0.060		77.8	70-130		30	
1,3-Dichlorobenzene	**0.0491**	0.020	ug/L	0.060		81.6	70-130		30	
1,4-Dichlorobenzene	**0.0480**	0.020	ug/L	0.060		79.9	70-130		30	
Dichlorodifluoromethane (R12)	**0.0497**	0.020	ug/L	0.049		101	70-130		30	
1,1-Dichloroethane	**0.0361**	0.020	ug/L	0.040		89.1	70-130		30	
1,2-Dichloroethane (EDC)	**0.0374**	0.020	ug/L	0.040		92.5	70-130		30	
cis-1,2-Dichloroethylene	**0.0369**	0.020	ug/L	0.040		93.0	70-130		30	
1,1-Dichloroethylene	**0.0421**	0.020	ug/L	0.040		106	70-130		30	
trans-1,2-Dichloroethylene	**0.0375**	0.020	ug/L	0.040		94.5	70-130		30	
1,2-Dichloropropane	**0.0405**	0.020	ug/L	0.046		87.6	70-130		30	
trans-1,3-Dichloropropylene	**0.0393**	0.020	ug/L	0.045		86.5	70-130		30	
cis-1,3-Dichloropropylene	**0.0389**	0.020	ug/L	0.045		85.7	70-130		30	
Dichlorotetrafluoroethane	**0.0748**	0.020	ug/L	0.070		107	70-130		30	
Ethylbenzene	**0.0371**	0.020	ug/L	0.043		85.5	70-130		30	
4-Ethyltoluene	**0.0421**	0.020	ug/L	0.049		85.6	70-130		30	
Hexachlorobutadiene	**0.0881**	0.020	ug/L	0.11		82.6	70-130		30	
2-Hexanone (MBK)	**0.0372**	0.020	ug/L	0.041		90.7	70-130		30	
Isopropanol (IPA)	**0.0236**	0.20	ug/L	0.025		96.1	70-130		30	
Methylene Chloride	**0.0359**	0.020	ug/L	0.035		103	70-130		30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0233 - *** DEFAULT PREP ****										
LCS (B6B0233-BS1) Continued				Prepared & Analyzed: 01/29/16						
4-Methyl-2-pentanone (MIBK)	**0.0394**	0.020	ug/L	0.041		96.3	70-130		30	
Styrene	**0.0342**	0.020	ug/L	0.043		80.2	70-130		30	
1,1,2,2-Tetrachloroethane	**0.0562**	0.020	ug/L	0.069		81.8	70-130		30	
Tetrachloroethylene (PCE)	**0.0555**	0.020	ug/L	0.068		81.8	70-130		30	
Toluene	**0.0326**	0.020	ug/L	0.038		86.6	70-130		30	
1,2,4-Trichlorobenzene	**0.0531**	0.020	ug/L	0.074		71.6	70-130		30	
1,1,2-Trichloroethane	**0.0467**	0.020	ug/L	0.055		85.5	70-130		30	
1,1,1-Trichloroethane	**0.0490**	0.020	ug/L	0.055		89.8	70-130		30	
Trichloroethylene (TCE)	**0.0473**	0.020	ug/L	0.054		88.0	70-130		30	
Trichlorofluoromethane (R11)	**0.0553**	0.020	ug/L	0.056		98.5	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0745**	0.020	ug/L	0.077		97.2	70-130		30	
1,3,5-Trimethylbenzene	**0.0407**	0.020	ug/L	0.049		82.7	70-130		30	
1,2,4-Trimethylbenzene	**0.0408**	0.020	ug/L	0.049		83.0	70-130		30	
Vinyl acetate	**0.0357**	0.020	ug/L	0.035		101	70-130		30	
Vinyl chloride	**0.0274**	0.020	ug/L	0.026		107	70-130		30	
o-Xylene	**0.0371**	0.020	ug/L	0.043		85.5	70-130		30	
m,p-Xylenes	**0.0738**	0.020	ug/L	0.087		85.0	70-130		30	
1,2,3-Trichloropropane	**0.0693**	0.020	ug/L	0.060		115	70-130		30	
sec-Butylbenzene	**0.0590**	0.020	ug/L	0.055		108	70-130		30	
Isopropylbenzene	**0.0562**	0.020	ug/L	0.049		114	70-130		30	
n-Propylbenzene	**0.0533**	0.020	ug/L	0.049		108	70-130		30	
4-Isopropyltoluene	**0.0581**	0.020	ug/L	0.055		106	70-130		30	
Surrogate: 4-Bromofluorobenzene	*0.154*		*ug/L*	*0.14*		*108*	*70-130*			
LCS Dup (B6B0233-BSD1)				Prepared & Analyzed: 01/29/16						
Acetone	**0.0220**	0.020	ug/L	0.024		92.6	70-130	11.7	30	
Benzene	**0.0268**	0.020	ug/L	0.032		83.8	70-130	3.06	30	
Benzyl chloride	**0.0423**	0.020	ug/L	0.052		81.7	70-130	1.98	30	
Bromodichloromethane	**0.0574**	0.020	ug/L	0.067		85.6	70-130	6.23	30	
Bromoform	**0.0913**	0.020	ug/L	0.10		88.3	70-130	4.40	30	
Bromomethane	**0.0329**	0.020	ug/L	0.039		84.7	70-130	16.5	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0233 - *** DEFAULT PREP ****										
LCS Dup (B6B0233-BSD1) Continued				Prepared & Analyzed: 01/29/16						
2-Butanone (MEK)	**0.0248**	0.020	ug/L	0.029		84.0	70-130	12.7	30	
Carbon Disulfide	**0.0326**	0.020	ug/L	0.031		105	70-130	6.61	30	
Carbon Tetrachloride	**0.0586**	0.020	ug/L	0.063		93.1	70-130	2.44	30	
Chlorobenzene	**0.0390**	0.020	ug/L	0.046		84.8	70-130	3.85	30	
Chloroethane	**0.0187**	0.020	ug/L	0.026		70.9	70-130	35.7	30	QR-02
Chloroform	**0.0412**	0.020	ug/L	0.049		84.4	70-130	6.31	30	
Chloromethane	**0.0212**	0.020	ug/L	0.021		103	70-130	7.21	30	
Dibromochloromethane	**0.0760**	0.020	ug/L	0.085		89.2	70-130	0.893	30	
1,2-Dibromoethane (EDB)	**0.0619**	0.020	ug/L	0.077		80.6	70-130	0.988	30	
1,2-Dichlorobenzene	**0.0473**	0.020	ug/L	0.060		78.6	70-130	1.02	30	
1,3-Dichlorobenzene	**0.0494**	0.020	ug/L	0.060		82.1	70-130	0.611	30	
1,4-Dichlorobenzene	**0.0477**	0.020	ug/L	0.060		79.4	70-130	0.628	30	
Dichlorodifluoromethane (R12)	**0.0466**	0.020	ug/L	0.049		94.3	70-130	6.46	30	
1,1-Dichloroethane	**0.0360**	0.020	ug/L	0.040		88.9	70-130	0.225	30	
1,2-Dichloroethane (EDC)	**0.0367**	0.020	ug/L	0.040		90.7	70-130	1.97	30	
cis-1,2-Dichloroethylene	**0.0354**	0.020	ug/L	0.040		89.2	70-130	4.17	30	
1,1-Dichloroethylene	**0.0385**	0.020	ug/L	0.040		97.1	70-130	9.05	30	
trans-1,2-Dichloroethylene	**0.0365**	0.020	ug/L	0.040		92.1	70-130	2.57	30	
1,2-Dichloropropane	**0.0404**	0.020	ug/L	0.046		87.5	70-130	0.114	30	
trans-1,3-Dichloropropylene	**0.0393**	0.020	ug/L	0.045		86.6	70-130	0.116	30	
cis-1,3-Dichloropropylene	**0.0403**	0.020	ug/L	0.045		88.7	70-130	3.44	30	
Dichlorotetrafluoroethane	**0.0717**	0.020	ug/L	0.070		102	70-130	4.30	30	
Ethylbenzene	**0.0353**	0.020	ug/L	0.043		81.4	70-130	4.91	30	
4-Ethyltoluene	**0.0412**	0.020	ug/L	0.049		83.8	70-130	2.13	30	
Hexachlorobutadiene	**0.0960**	0.020	ug/L	0.11		90.0	70-130	8.57	30	
2-Hexanone (MBK)	**0.0357**	0.020	ug/L	0.041		87.1	70-130	4.05	30	
Isopropanol (IPA)	**0.0226**	0.20	ug/L	0.025		91.9	70-130	4.47	30	
Methylene Chloride	**0.0259**	0.020	ug/L	0.035		74.7	70-130	32.2	30	QR-02
4-Methyl-2-pentanone (MIBK)	**0.0379**	0.020	ug/L	0.041		92.6	70-130	3.92	30	
Styrene	**0.0343**	0.020	ug/L	0.043		80.6	70-130	0.497	30	
1,1,2,2-Tetrachloroethane	**0.0568**	0.020	ug/L	0.069		82.7	70-130	1.09	30	
Tetrachloroethylene (PCE)	**0.0538**	0.020	ug/L	0.068		79.3	70-130	3.10	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0233 - *** DEFAULT PREP ****										
LCS Dup (B6B0233-BSD1) Continued				Prepared & Analyzed: 01/29/16						
Toluene	**0.0315**	0.020	ug/L	0.038		83.7	70-130	3.41	30	
1,2,4-Trichlorobenzene	**0.0600**	0.020	ug/L	0.074		80.8	70-130	12.1	30	
1,1,2-Trichloroethane	**0.0435**	0.020	ug/L	0.055		79.7	70-130	7.02	30	
1,1,1-Trichloroethane	**0.0476**	0.020	ug/L	0.055		87.3	70-130	2.82	30	
Trichloroethylene (TCE)	**0.0458**	0.020	ug/L	0.054		85.3	70-130	3.12	30	
Trichlorofluoromethane (R11)	**0.0524**	0.020	ug/L	0.056		93.3	70-130	5.42	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0715**	0.020	ug/L	0.077		93.3	70-130	4.09	30	
1,3,5-Trimethylbenzene	**0.0409**	0.020	ug/L	0.049		83.2	70-130	0.603	30	
1,2,4-Trimethylbenzene	**0.0398**	0.020	ug/L	0.049		80.9	70-130	2.56	30	
Vinyl acetate	**0.0326**	0.020	ug/L	0.035		92.6	70-130	8.97	30	
Vinyl chloride	**0.0260**	0.020	ug/L	0.026		102	70-130	4.98	30	
o-Xylene	**0.0356**	0.020	ug/L	0.043		81.9	70-130	4.30	30	
m,p-Xylenes	**0.0709**	0.020	ug/L	0.087		81.6	70-130	4.02	30	
1,2,3-Trichloropropane	**0.0675**	0.020	ug/L	0.060		112	70-130	2.73	30	
sec-Butylbenzene	**0.0580**	0.020	ug/L	0.055		106	70-130	1.69	30	
Isopropylbenzene	**0.0547**	0.020	ug/L	0.049		111	70-130	2.84	30	
n-Propylbenzene	**0.0528**	0.020	ug/L	0.049		107	70-130	0.927	30	
4-Isopropyltoluene	**0.0575**	0.020	ug/L	0.055		105	70-130	1.14	30	
Surrogate: 4-Bromofluorobenzene	*0.148*		*ug/L*	*0.14*		*103*	*70-130*			
Duplicate (B6B0233-DUP1)			**Source: 6B02021-40**	Prepared & Analyzed: 01/29/16						
Acetone	**<4.0**	4.0	ug/L		<4.0				30	
Allyl chloride	**<4.0**	4.0	ug/L		<4.0				30	
tert-Amyl Methyl Ether (TAME)	**<4.0**	4.0	ug/L		<4.0				30	
Benzene	**<4.0**	4.0	ug/L		<4.0				30	
Benzyl chloride	**<4.0**	4.0	ug/L		<4.0				30	
Bromodichloromethane	**<4.0**	4.0	ug/L		<4.0				30	
Bromoform	**<4.0**	4.0	ug/L		<4.0				30	
Bromomethane	**<4.0**	4.0	ug/L		<4.0				30	
1,3-Butadiene	**<4.0**	4.0	ug/L		<4.0				30	
2-Butanone (MEK)	**<4.0**	4.0	ug/L		<4.0				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0233 - *** DEFAULT PREP ****										
Duplicate (B6B0233-DUP1) Continued	**Source: 6B02021-40**	Prepared & Analyzed: 01/29/16								
tert-Butyl alcohol (TBA)	**<4000**	4000	ug/L		<4000				30	
Carbon Disulfide	**<4.0**	4.0	ug/L		<4.0				30	
Carbon Tetrachloride	**<4.0**	4.0	ug/L		<4.0				30	
Chlorobenzene	**<4.0**	4.0	ug/L		<4.0				30	
Chloroethane	**<4.0**	4.0	ug/L		<4.0				30	
Chloroform	**<4.0**	4.0	ug/L		<4.0				30	
Chloromethane	**<4.0**	4.0	ug/L		<4.0				30	
Cyclohexane	**<4.0**	4.0	ug/L		<4.0				30	
Dibromochloromethane	**<4.0**	4.0	ug/L		<4.0				30	
1,2-Dibromoethane (EDB)	**<4.0**	4.0	ug/L		<4.0				30	
1,2-Dichlorobenzene	**<4.0**	4.0	ug/L		<4.0				30	
1,3-Dichlorobenzene	**<4.0**	4.0	ug/L		<4.0				30	
1,4-Dichlorobenzene	**<4.0**	4.0	ug/L		<4.0				30	
Dichlorodifluoromethane (R12)	**<4.0**	4.0	ug/L		<4.0				30	
1,1-Dichloroethane	**<4.0**	4.0	ug/L		<4.0				30	
1,2-Dichloroethane (EDC)	**<4.0**	4.0	ug/L		<4.0				30	
cis-1,2-Dichloroethylene	**<4.0**	4.0	ug/L		<4.0				30	
1,1-Dichloroethylene	**<4.0**	4.0	ug/L		<4.0				30	
trans-1,2-Dichloroethylene	**<4.0**	4.0	ug/L		<4.0				30	
1,2-Dichloropropane	**<4.0**	4.0	ug/L		<4.0				30	
trans-1,3-Dichloropropylene	**<4.0**	4.0	ug/L		<4.0				30	
cis-1,3-Dichloropropylene	**<4.0**	4.0	ug/L		<4.0				30	
Dichlorotetrafluoroethane	**<4.0**	4.0	ug/L		<4.0				30	
Diisopropyl ether (DIPE)	**<4.0**	4.0	ug/L		<4.0				30	
1,4-Dioxane	**<4.0**	4.0	ug/L		<4.0				30	
Ethanol	**<4.0**	4.0	ug/L		<4.0				30	
Ethyl Acetate	**<4.0**	4.0	ug/L		<4.0				30	
Ethylbenzene	**<4.0**	4.0	ug/L		<4.0				30	
Ethyl-tert-Butyl Ether (ETBE)	**<4.0**	4.0	ug/L		<4.0				30	
4-Ethyltoluene	**<4.0**	4.0	ug/L		<4.0				30	
Heptane	**4.37**	4.0	ug/L		4.54			3.86	30	
Hexachlorobutadiene	**<4.0**	4.0	ug/L		<4.0				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0233 - *** DEFAULT PREP ****										
Duplicate (B6B0233-DUP1) Continued	**Source: 6B02021-40**	Prepared & Analyzed: 01/29/16								
n-Hexane	**4.11**	4.0	ug/L		4.45			7.91	30	
2-Hexanone (MBK)	**<4.0**	4.0	ug/L		<4.0				30	
Isopropanol (IPA)	**<40**	40	ug/L		<40				30	
Methyl-tert-Butyl Ether (MTBE)	**<4.0**	4.0	ug/L		<4.0				30	
Methylene Chloride	**<4.0**	4.0	ug/L		<4.0				30	
4-Methyl-2-pentanone (MIBK)	**<4.0**	4.0	ug/L		<4.0				30	
Naphthalene	**<4.0**	4.0	ug/L		<4.0				30	
Propylene	**<4.0**	4.0	ug/L		<4.0				30	
Styrene	**<4.0**	4.0	ug/L		<4.0				30	
1,1,2,2-Tetrachloroethane	**<4.0**	4.0	ug/L		<4.0				30	
Tetrachloroethylene (PCE)	**<4.0**	4.0	ug/L		<4.0				30	
Tetrahydrofuran (THF)	**<4.0**	4.0	ug/L		<4.0				30	
Toluene	**<4.0**	4.0	ug/L		<4.0				30	
1,2,4-Trichlorobenzene	**<4.0**	4.0	ug/L		<4.0				30	
1,1,2-Trichloroethane	**<4.0**	4.0	ug/L		<4.0				30	
1,1,1-Trichloroethane	**<4.0**	4.0	ug/L		<4.0				30	
Trichloroethylene (TCE)	**<4.0**	4.0	ug/L		<4.0				30	
Trichlorofluoromethane (R11)	**<4.0**	4.0	ug/L		<4.0				30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**<4.0**	4.0	ug/L		<4.0				30	
1,3,5-Trimethylbenzene	**<4.0**	4.0	ug/L		<4.0				30	
1,2,4-Trimethylbenzene	**<4.0**	4.0	ug/L		<4.0				30	
2,2,4-Trimethylpentane	**41.7**	4.0	ug/L		43.7			4.79	30	
Vinyl acetate	**<4.0**	4.0	ug/L		<4.0				30	
Vinyl bromide	**<4.0**	4.0	ug/L		<4.0				30	
Vinyl chloride	**<4.0**	4.0	ug/L		<4.0				30	
o-Xylene	**<4.0**	4.0	ug/L		<4.0				30	
m,p-Xylenes	**<4.0**	4.0	ug/L		<4.0				30	
1,1,1,2-Tetrachloroethane	**<0.020**	0.020	ug/L		<4.0				30	
1,2,3-Trichloropropane	**<4.0**	4.0	ug/L		<4.0				30	
sec-Butylbenzene	**<4.0**	4.0	ug/L		<4.0				30	
Isopropylbenzene	**<4.0**	4.0	ug/L		<4.0				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6B0233 - *** DEFAULT PREP ****										
Duplicate (B6B0233-DUP1) Continued			**Source: 6B02021-40**	Prepared & Analyzed: 01/29/16						
n-Propylbenzene	**<4.0**	4.0	ug/L		<4.0				30	
4-Isopropyltoluene	**<4.0**	4.0	ug/L		<4.0				30	
n-Butylbenzene	**<4.0**	4.0	ug/L		<4.0				30	
Surrogate: 4-Bromofluorobenzene	*0.169*		*ug/L*	*0.14*		*118*	*70-130*			
Fixed Gases by TCD - Quality Control										
*Batch B6B0317 - *** DEFAULT PREP ****										
Blank (B6B0317-BLK1)				Prepared & Analyzed: 01/27/16						
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B6B0317-BS1)				Prepared & Analyzed: 01/27/16						
Methane	**4.45**	0.10	% by Volume	4.5		98.9	75-125			
Oxygen	**3.93**	0.10	% by Volume	4.0		98.2	75-125			
Carbon Dioxide	**13.8**	0.10	% by Volume	15		92.0	75-125			
LCS Dup (B6B0317-BSD1)				Prepared & Analyzed: 01/27/16						
Methane	**4.46**	0.10	% by Volume	4.5		99.2	75-125	0.314	30	
Oxygen	**3.93**	0.10	% by Volume	4.0		98.2	75-125	0.0509	30	
Carbon Dioxide	**13.7**	0.10	% by Volume	15		91.3	75-125	0.764	30	
Duplicate (B6B0317-DUP1)			**Source: 6B02021-13**	Prepared & Analyzed: 01/27/16						
Methane	**<0.10**	0.10	% by Volume		<0.10				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
*Batch B6B0317 - *** DEFAULT PREP ****										
Duplicate (B6B0317-DUP1) Continued			**Source: 6B02021-13**	Prepared & Analyzed: 01/27/16						
Oxygen	**18.2**	0.10	% by Volume		18.2			0.247	30	
Carbon Dioxide	**<0.10**	0.10	% by Volume		<0.10				30	
*Batch B6B0318 - *** DEFAULT PREP ****										
Blank (B6B0318-BLK1)				Prepared & Analyzed: 01/28/16						
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B6B0318-BS1)				Prepared & Analyzed: 01/28/16						
Methane	**4.46**	0.10	% by Volume	4.5		99.2	75-125			
Oxygen	**3.71**	0.10	% by Volume	4.0		92.7	75-125			
Carbon Dioxide	**13.6**	0.10	% by Volume	15		90.7	75-125			
LCS Dup (B6B0318-BSD1)				Prepared & Analyzed: 01/28/16						
Methane	**4.61**	0.10	% by Volume	4.5		103	75-125	3.33	30	
Oxygen	**3.66**	0.10	% by Volume	4.0		91.6	75-125	1.25	30	
Carbon Dioxide	**14.0**	0.10	% by Volume	15		93.0	75-125	2.51	30	
Duplicate (B6B0318-DUP1)			**Source: 6B02021-22**	Prepared & Analyzed: 01/28/16						
Methane	**<0.10**	0.10	% by Volume		<0.10				30	
Oxygen	**14.0**	0.10	% by Volume		13.4			4.24	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187306
Date Received: 01/29/16
Date Reported: 02/12/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
*Batch B6B0318 - *** DEFAULT PREP ****										
Duplicate (B6B0318-DUP1) Continued			**Source: 6B02021-22**	Prepared & Analyzed: 01/28/16						
Carbon Dioxide	**3.91**	0.10	% by Volume		4.18			6.53	30	
*Batch B6B0319 - *** DEFAULT PREP ****										
Blank (B6B0319-BLK1)				Prepared & Analyzed: 01/29/16						
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B6B0319-BS1)				Prepared & Analyzed: 01/29/16						
Methane	**4.37**	0.10	% by Volume	4.5		97.1	75-125			
Oxygen	**3.87**	0.10	% by Volume	4.0		96.7	75-125			
Carbon Dioxide	**13.3**	0.10	% by Volume	15		88.7	75-125			
LCS Dup (B6B0319-BSD1)				Prepared & Analyzed: 01/29/16						
Methane	**4.54**	0.10	% by Volume	4.5		101	75-125	3.95	30	
Oxygen	**3.64**	0.10	% by Volume	4.0		90.9	75-125	6.13	30	
Carbon Dioxide	**13.5**	0.10	% by Volume	15		89.7	75-125	1.08	30	
Duplicate (B6B0319-DUP1)			**Source: 6B02021-40**	Prepared & Analyzed: 01/29/16						
Methane	**<0.10**	0.10	% by Volume		<0.10				30	
Oxygen	**13.8**	0.10	% by Volume		13.6			1.13	30	
Carbon Dioxide	**3.53**	0.10	% by Volume		3.60			1.94	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187306
Project No:	496965.A1.01	**Date Received:**	01/29/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	02/12/16

Special Notes

[1] = ******* : Surrogate recovery is outside of the upper control limit due to matrix interference.

[2] = **E** : The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate (CLP E-flag).

[3] = **QR-02** : The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.

Allen Aminian
QA/QC Manager

AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311
Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.: 124329
70045359
Page 1 of 2

Client: CH2M HILL | Project Name / No.: KINDER MORGAN NORWALK | Sampler's Name: WILLIAM SCHNEWEIS
Project Manager: DAN JABLONSKI | Site Address: 15306 NORWALK BLVD | Sampler's Signature:
Phone: | City: NORWALK | P.O. No.:
Fax: | State & Zip: CA | Quote No.:

TAT Turnaround Codes **

(1) = Same Day Rush
(2) = 24 Hour Rush
(3) = 48 Hour Rush
(4) = 72 Hour Rush
(5) = 5 Day Rush
X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

Please enter the TAT Turnaround Codes ** below

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	Special Instructions
SVM-25-15	6B02021-1	1-27-16	0837	V	2	pv3
SVM-1-5	-2		0851	V	2	
SVM-2-15-15	-3		0859	V	2	
SVM-15-7	-4		1037	V	2	
SVM-15-15	-5		1041	V	2	
SVM-15-22	-6		1105	V	2	
SVM-6-7	-7		1136	V	2	
SVM-6-16	-8		1150	V	2	
SVM-7-7	-9		1221	V	2	
SVM-7-13	-10		1233	V	2	
SVM-10-15	-11		1323	V	2	
SVM-3-15	-12		1346	V	2	
SVM-3-5	-13		1405	V	2	
SVM-35 DUP	-14		1405	V	2	
SVM-5-15	-15		1455	V	2	

For Laboratory Use
REVIEWED
Date 2/1/16 Time 10:00
TAT 5 Days Sign:

A.A. Project No.: MB187306/6B02021

Relinquished by	Date	Time	Received by
	01/27/2016	1507	
	1/29/16	19:00	

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client-requested analyses performed on this project.

AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311
Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.: 124330
70044038
Page 2 of 2

Client: CH2M HILL | Project Name / No.: KINDER MORGAN NORWALK | Sampler's Name: [illegible]
Project Manager: DAN JAGLOWSKI | Site Address: 15306 NORWALK BLVD | Sampler's Signature:
Phone: | City: NORWALK | P.O. No.:
Fax: | State & Zip: CA | Quote No.:

TAT Turnaround Codes **

(1) = Same Day Rush
(2) = 24 Hour Rush
(3) = 48 Hour Rush
(4) = 72 Hour Rush
(5) = 5 Day Rush
X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

Please enter the TAT Turnaround Codes ** below

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	TDS	FINDS CHK	Special Instructions
SVM-5S	6B02021-16	1-27-16	1456	V	2	X	X	NS
AMBIENT AIR	-17	1-27-16	1504	V	2	X	X	

For Laboratory Use

REVIEWED
Date 2/1/16 Time 10:00
TAT 5 Days Sign:

A.A. Project No.: MB187306/6B02021

Relinquished by	Date	Time	Received by
[signature]	01/27/2016	1507	[signature]
[signature]	1/29/16	19:00	[signature]
	Date	Time	Received by

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client requested analyses performed on this project.

AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311
Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.: 12433

70044039

Page 1 of 1

Client: CH2M HILL | Project Name / No.: KINDER MORGAN NORWALK | Sampler's Name: WILLIAM STOREY

Project Manager: DAN JABLONSKI | Site Address: 13306 NORWALK BLVD | Sampler's Signature:

Phone: | City: NORWALK | P.O. No.:

Fax: | State & Zip: CA. | Quote No.:

TAT Turnaround Codes **

(1) = Same Day Rush
(2) = 24 Hour Rush
(3) = 48 Hour Rush
(4) = 72 Hour Rush
(5) = 5 Day Rush
X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

Please enter the TAT Turnaround Codes ** below

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	TO15	TO3	FLOW CONT	Special Instructions
SVM-8-15	6B02021-18	1-28-16	0805	V	2	X	X	X	
SVM-8-5	-19		0824	V	2	X	X	X	
SVM-16-7	-20		0904	V	2	X	X	X	
SVM-16-16	-21		0925	V	2	X	X	X	
SVM-16-22	-22		0936	V	2	X	X	X	
SVM-16-22 DUP	-23		0936	V	2	X	X	X	
SVM-6-16 RE	-24		1058	V	2	X	X	X	RERUN FROM 1/
SVM-16-16 RE	-25		1153	V	2	X	X	X	RERUN
SVM-16-22 RE	-26		1206	V	2	X	X	X	RERUN
SVM-16-22 DUP RE	-27		1206	V	2	X	X	X	RERUN
AMBIENT AIR	-28	1-28-16	1420	V	1	X	X		

RECEIVED

For Laboratory Use

Date 2/1/16 Time 10:00

TAT 5 Days Sign:

A.A. Project No.: MB187306/6B02021

Relinquished by	Date	Time	Received by
	1-28-16	1430	
	1/29/16	19:18	
	Date	Time	Received by

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client-requested analyses performed on this project.

AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311
Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.: 124332
70045358
Page 1 of 2

Client: CH2M HILL | Project Name / No.: KINDER MORGAN NORWALK | Sampler's Name: William Scheckler
Project Manager: DAN JABLONSKI | Site Address: 15306 NORWALK BLVD | Sampler's Signature:
Phone: | City: NORWALK | P.O. No.:
Fax: | State & Zip: CA | Quote No.:

TAT Turnaround Codes **

(1) = Same Day Rush
(2) = 24 Hour Rush
(3) = 48 Hour Rush
(4) = 72 Hour Rush
(5) = 5 Day Rush
X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

Please enter the TAT Turnaround Codes ** below

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	TOC	703	KINDER Comp	Special Instructions
SVM-11-7	6B02021-29	1-29-16	0814	V	2	X	X	X	
SVM-11-21	-30		0817	V	2	X	X	X	
SVM-11-15	-31		0831	V	2	X	X	X	
SVM-12-7	-32		0938	V	2	X	X	X	
SVM-12-22	-33		0941	V	2	X	X	X	
SVM-12-15	-34		0951	V	2	X	X	X	
SVM-13-23	-35		1051	V	2	X	X	X	
SVM-13-7	-36		1055	V	2	X	X	X	
SVM-13-15.5	-37		1119	V	2	X	X	X	
SVM-14-22	-38		1223	V	2	X	X	X	
SVM-14-7	-39		1228	V	2	X	X	X	
SVM-14-15	-40		1246	V	2	X	X	X	
SVM-14-15 DUP	-41		1246	V	2	X	X	X	
AMBIENT AIR	-42		1252	V	2	X	X	X	
SVM-16-16.22	-43	↓	1615	V	1	X	X		

For Laboratory Use

REVIEWED
Date 2/1/16 Time 10:00
TAT 5 Days Sign:

A.A. Project No.: MB18730 6/6B02021

Relinquished by	Date	Time	Received by
	01/29/2016	1707	
	1/29/16	1930	

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client requested services performed by American Analytics.

AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311
Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.: 124333
70045351
Page 2 of 2

Client: CH2M HILL | Project Name / No.: KINDER MORGAN NORWALK | Sampler's Name: WILLIAM SEYBOLDT
Project Manager: DAN JASKOWSKI | Site Address: 15306 NORWALK BLVD | Sampler's Signature:
Phone: | City: NORWALK | P.O. No.:
Fax: | State & Zip: CA. | Quote No.:

TAT Turnaround Codes **

(1) = Same Day Rush
(2) = 24 Hour Rush
(3) = 48 Hour Rush
(4) = 72 Hour Rush
(5) = 5 Day Rush
X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

Please enter the TAT Turnaround Codes ** below

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	1615	1703	Special Instructions
SVM-16-22R2	6B02021-44	1-29-16	1615	V	1	X	X	
SVM-6-16R2	-45	1-29-16	1700	V	1	X	X	

For Laboratory Use
REVIEWED
Date 2/1/16 Time 10:00
TAT 5 Days Sign:
A.A. Project No.: MB187306/6B02021

Relinquished by	Date	Time	Received by
	01/29/2016	1707	
	1/29/16	19:00	
	Date	Time	Received by

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client-requested analyses performed on this project.

AMERICAN ANALYTICS

9765 Eton Avenue
Chatsworth
California 91311
Tel: (818) 998-5547
Fax: (818) 998-7258

March 11, 2016

Dan Jablonski

CH2M Hill, Inc.

1000 Wilshire Blvd., Suite 2100

Los Angeles, CA 90017-2457

Re : KMEP Norwalk Biosparge Startup / 496965.A1.01

MB187307 / 6B29001

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received on 02/26/16 17:00 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Assurance Program Manual, applicable standard operating procedures, and other related documentation. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report or require additional information please call me at American Analytics.

Sincerely,

Allen Aminian

QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
Fixed Gases - Field					
SVM-1-15	6B29001-01	Vapor	5	02/24/16 08:15	02/26/16 17:00
SVM-1-5	6B29001-02	Vapor	5	02/24/16 08:29	02/26/16 17:00
SVM-2-5	6B29001-03	Vapor	5	02/24/16 09:33	02/26/16 17:00
SVM-15-7	6B29001-04	Vapor	5	02/24/16 10:18	02/26/16 17:00
SVM-15-22	6B29001-05	Vapor	5	02/24/16 10:18	02/26/16 17:00
SVM-15-15	6B29001-06	Vapor	5	02/24/16 10:30	02/26/16 17:00
SVM-6-16	6B29001-08	Vapor	5	02/24/16 11:07	02/26/16 17:00
SVM-6-16 DUP	6B29001-09	Vapor	5	02/24/16 11:07	02/26/16 17:00
SVM-6-7	6B29001-10	Vapor	5	02/24/16 11:15	02/26/16 17:00
SVM-7-7	6B29001-11	Vapor	5	02/24/16 13:45	02/26/16 17:00
SVM-7-13	6B29001-12	Vapor	5	02/24/16 14:08	02/26/16 17:00
SVM-10-15	6B29001-13	Vapor	5	02/24/16 14:23	02/26/16 17:00
SVM-5-15	6B29001-14	Vapor	5	02/25/16 07:48	02/26/16 17:00
SVM-5-5	6B29001-15	Vapor	5	02/25/16 08:01	02/26/16 17:00
SVM-8-15	6B29001-16	Vapor	5	02/25/16 08:36	02/26/16 17:00
SVM-8-5	6B29001-17	Vapor	5	02/25/16 08:47	02/26/16 17:00
SVM-16-22	6B29001-18	Vapor	5	02/25/16 09:22	02/26/16 17:00
SVM-16-22 DUP	6B29001-19	Vapor	5	02/25/16 09:22	02/26/16 17:00
SVM-16-7	6B29001-20	Vapor	5	02/25/16 09:36	02/26/16 17:00

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-16-16	6B29001-21	Vapor	5	02/25/16 09:48	02/26/16 17:00
SVM-3-15	6B29001-22	Vapor	5	02/25/16 11:22	02/26/16 17:00
SVM-3-5	6B29001-23	Vapor	5	02/25/16 11:48	02/26/16 17:00
SVM-3-5 DUP	6B29001-24	Vapor	5	02/25/16 11:48	02/26/16 17:00
SVM-12-15	6B29001-25	Vapor	5	02/25/16 12:44	02/26/16 17:00
SVM-12-7	6B29001-27	Vapor	5	02/25/16 13:10	02/26/16 17:00
SVM-12-22	6B29001-28	Vapor	5	02/25/16 13:10	02/26/16 17:00
SVM-11-22	6B29001-29	Vapor	5	02/26/16 08:09	02/26/16 17:00
SVM-11-7	6B29001-30	Vapor	5	02/26/16 08:11	02/26/16 17:00
SVM-11-15	6B29001-31	Vapor	5	02/26/16 08:21	02/26/16 17:00
SVM-13-22.5	6B29001-32	Vapor	5	02/26/16 09:11	02/26/16 17:00
SVM-13-7	6B29001-33	Vapor	5	02/26/16 09:13	02/26/16 17:00
SVM-13-15.5	6B29001-34	Vapor	5	02/26/16 09:28	02/26/16 17:00
SVM-14-22	6B29001-35	Vapor	5	02/26/16 10:28	02/26/16 17:00
SVM-14-7	6B29001-36	Vapor	5	02/26/16 10:35	02/26/16 17:00
SVM-14-15	6B29001-37	Vapor	5	02/26/16 10:50	02/26/16 17:00
SVM-14-15 DUP	6B29001-38	Vapor	5	02/26/16 10:50	02/26/16 17:00
TO-15 (Mid Level)					
SVM-1-15	6B29001-01	Vapor	5	02/24/16 08:15	02/26/16 17:00
SVM-1-5	6B29001-02	Vapor	5	02/24/16 08:29	02/26/16 17:00

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-2-5	6B29001-03	Vapor	5	02/24/16 09:33	02/26/16 17:00
SVM-15-7	6B29001-04	Vapor	5	02/24/16 10:18	02/26/16 17:00
SVM-15-22	6B29001-05	Vapor	5	02/24/16 10:18	02/26/16 17:00
SVM-15-15	6B29001-06	Vapor	5	02/24/16 10:30	02/26/16 17:00
Ambient Air	6B29001-07	Vapor	5	02/24/16 11:03	02/26/16 17:00
SVM-6-16	6B29001-08	Vapor	5	02/24/16 11:07	02/26/16 17:00
SVM-6-16 DUP	6B29001-09	Vapor	5	02/24/16 11:07	02/26/16 17:00
SVM-6-7	6B29001-10	Vapor	5	02/24/16 11:15	02/26/16 17:00
SVM-7-7	6B29001-11	Vapor	5	02/24/16 13:45	02/26/16 17:00
SVM-7-13	6B29001-12	Vapor	5	02/24/16 14:08	02/26/16 17:00
SVM-10-15	6B29001-13	Vapor	5	02/24/16 14:23	02/26/16 17:00
SVM-5-15	6B29001-14	Vapor	5	02/25/16 07:48	02/26/16 17:00
SVM-5-5	6B29001-15	Vapor	5	02/25/16 08:01	02/26/16 17:00
SVM-8-15	6B29001-16	Vapor	5	02/25/16 08:36	02/26/16 17:00
SVM-8-5	6B29001-17	Vapor	5	02/25/16 08:47	02/26/16 17:00
SVM-16-22	6B29001-18	Vapor	5	02/25/16 09:22	02/26/16 17:00
SVM-16-22 DUP	6B29001-19	Vapor	5	02/25/16 09:22	02/26/16 17:00
SVM-16-7	6B29001-20	Vapor	5	02/25/16 09:36	02/26/16 17:00
SVM-16-16	6B29001-21	Vapor	5	02/25/16 09:48	02/26/16 17:00
SVM-3-15	6B29001-22	Vapor	5	02/25/16 11:22	02/26/16 17:00

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-3-5	6B29001-23	Vapor	5	02/25/16 11:48	02/26/16 17:00
SVM-3-5 DUP	6B29001-24	Vapor	5	02/25/16 11:48	02/26/16 17:00
SVM-12-15	6B29001-25	Vapor	5	02/25/16 12:44	02/26/16 17:00
Ambient Air	6B29001-26	Vapor	5	02/25/16 12:53	02/26/16 17:00
SVM-12-7	6B29001-27	Vapor	5	02/25/16 13:10	02/26/16 17:00
SVM-12-22	6B29001-28	Vapor	5	02/25/16 13:10	02/26/16 17:00
SVM-11-22	6B29001-29	Vapor	5	02/26/16 08:09	02/26/16 17:00
SVM-11-7	6B29001-30	Vapor	5	02/26/16 08:11	02/26/16 17:00
SVM-11-15	6B29001-31	Vapor	5	02/26/16 08:21	02/26/16 17:00
SVM-13-22.5	6B29001-32	Vapor	5	02/26/16 09:11	02/26/16 17:00
SVM-13-7	6B29001-33	Vapor	5	02/26/16 09:13	02/26/16 17:00
SVM-13-15.5	6B29001-34	Vapor	5	02/26/16 09:28	02/26/16 17:00
SVM-14-22	6B29001-35	Vapor	5	02/26/16 10:28	02/26/16 17:00
SVM-14-7	6B29001-36	Vapor	5	02/26/16 10:35	02/26/16 17:00
SVM-14-15	6B29001-37	Vapor	5	02/26/16 10:50	02/26/16 17:00
SVM-14-15 DUP	6B29001-38	Vapor	5	02/26/16 10:50	02/26/16 17:00
Ambient Air	6B29001-39	Vapor	5	02/26/16 11:13	02/26/16 17:00
TO-3					
SVM-1-15	6B29001-01	Vapor	5	02/24/16 08:15	02/26/16 17:00
SVM-1-5	6B29001-02	Vapor	5	02/24/16 08:29	02/26/16 17:00

Allen Aminian
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LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-2-5	6B29001-03	Vapor	5	02/24/16 09:33	02/26/16 17:00
SVM-15-7	6B29001-04	Vapor	5	02/24/16 10:18	02/26/16 17:00
SVM-15-22	6B29001-05	Vapor	5	02/24/16 10:18	02/26/16 17:00
SVM-15-15	6B29001-06	Vapor	5	02/24/16 10:30	02/26/16 17:00
Ambient Air	6B29001-07	Vapor	5	02/24/16 11:03	02/26/16 17:00
SVM-6-16	6B29001-08	Vapor	5	02/24/16 11:07	02/26/16 17:00
SVM-6-16 DUP	6B29001-09	Vapor	5	02/24/16 11:07	02/26/16 17:00
SVM-6-7	6B29001-10	Vapor	5	02/24/16 11:15	02/26/16 17:00
SVM-7-7	6B29001-11	Vapor	5	02/24/16 13:45	02/26/16 17:00
SVM-7-13	6B29001-12	Vapor	5	02/24/16 14:08	02/26/16 17:00
SVM-10-15	6B29001-13	Vapor	5	02/24/16 14:23	02/26/16 17:00
SVM-5-15	6B29001-14	Vapor	5	02/25/16 07:48	02/26/16 17:00
SVM-5-5	6B29001-15	Vapor	5	02/25/16 08:01	02/26/16 17:00
SVM-8-15	6B29001-16	Vapor	5	02/25/16 08:36	02/26/16 17:00
SVM-8-5	6B29001-17	Vapor	5	02/25/16 08:47	02/26/16 17:00
SVM-16-22	6B29001-18	Vapor	5	02/25/16 09:22	02/26/16 17:00
SVM-16-22 DUP	6B29001-19	Vapor	5	02/25/16 09:22	02/26/16 17:00
SVM-16-7	6B29001-20	Vapor	5	02/25/16 09:36	02/26/16 17:00
SVM-16-16	6B29001-21	Vapor	5	02/25/16 09:48	02/26/16 17:00
SVM-3-15	6B29001-22	Vapor	5	02/25/16 11:22	02/26/16 17:00

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Sample ID	Laboratory ID	Matrix	TAT	Date Sampled	Date Received
SVM-3-5	6B29001-23	Vapor	5	02/25/16 11:48	02/26/16 17:00
SVM-3-5 DUP	6B29001-24	Vapor	5	02/25/16 11:48	02/26/16 17:00
SVM-12-15	6B29001-25	Vapor	5	02/25/16 12:44	02/26/16 17:00
Ambient Air	6B29001-26	Vapor	5	02/25/16 12:53	02/26/16 17:00
SVM-12-7	6B29001-27	Vapor	5	02/25/16 13:10	02/26/16 17:00
SVM-12-22	6B29001-28	Vapor	5	02/25/16 13:10	02/26/16 17:00
SVM-11-22	6B29001-29	Vapor	5	02/26/16 08:09	02/26/16 17:00
SVM-11-7	6B29001-30	Vapor	5	02/26/16 08:11	02/26/16 17:00
SVM-11-15	6B29001-31	Vapor	5	02/26/16 08:21	02/26/16 17:00
SVM-13-22.5	6B29001-32	Vapor	5	02/26/16 09:11	02/26/16 17:00
SVM-13-7	6B29001-33	Vapor	5	02/26/16 09:13	02/26/16 17:00
SVM-13-15.5	6B29001-34	Vapor	5	02/26/16 09:28	02/26/16 17:00
SVM-14-22	6B29001-35	Vapor	5	02/26/16 10:28	02/26/16 17:00
SVM-14-7	6B29001-36	Vapor	5	02/26/16 10:35	02/26/16 17:00
SVM-14-15	6B29001-37	Vapor	5	02/26/16 10:50	02/26/16 17:00
SVM-14-15 DUP	6B29001-38	Vapor	5	02/26/16 10:50	02/26/16 17:00
Ambient Air	6B29001-39	Vapor	5	02/26/16 11:13	02/26/16 17:00

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
		Fixed Gases by TCD						
Oxygen	SVM-1-15	**19**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Oxygen	SVM-1-5	**19**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Carbon Dioxide	SVM-1-5	**0.24**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Oxygen	SVM-2-5	**19**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Oxygen	SVM-15-7	**19**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Oxygen	SVM-15-22	**17**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Carbon Dioxide	SVM-15-22	**1.1**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Oxygen	SVM-15-15	**19**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Oxygen	SVM-6-16	**19**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Oxygen	SVM-6-16 DUP	**19**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-6-7	**19**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Oxygen	SVM-7-7	**19**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Carbon Dioxide	SVM-7-7	**0.12**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Oxygen	SVM-7-13	**19**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Carbon Dioxide	SVM-7-13	**0.18**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Oxygen	SVM-10-15	**17**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Carbon Dioxide	SVM-10-15	**3.7**	0.10	% by Volume	1	02/24/16	02/24/16	VOCs by GC/TCD
Oxygen	SVM-5-15	**19**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Oxygen	SVM-5-5	**19**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Oxygen	SVM-8-15	**19**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-8-15	**0.10**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-8-5	**19**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-8-5	**0.11**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Oxygen	SVM-16-22	**11**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-22	**5.9**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Oxygen	SVM-16-22 DUP	**11**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-22 DUP	**5.7**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Oxygen	SVM-16-7	**19**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-7	**0.16**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Oxygen	SVM-16-16	**18**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-16-16	**0.53**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Oxygen	SVM-3-15	**18**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Carbon Dioxide	SVM-3-15	**0.14**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Oxygen	SVM-3-5	**19**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-3-5	**0.14**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Oxygen	SVM-3-5 DUP	**18**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-3-5 DUP	**0.14**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Oxygen	SVM-12-15	**11**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-12-15	**1.5**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Oxygen	SVM-12-7	**17**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-12-7	**0.35**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Oxygen	SVM-12-22	**1.1**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD
Carbon Dioxide	SVM-12-22	**11**	0.10	% by Volume	1	02/25/16	02/25/16	VOCs by GC/TCD

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Oxygen	SVM-11-22	**19**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Carbon Dioxide	SVM-11-22	**0.26**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Oxygen	SVM-11-7	**18**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Carbon Dioxide	SVM-11-7	**0.17**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Oxygen	SVM-11-15	**15**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Carbon Dioxide	SVM-11-15	**0.28**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Oxygen	SVM-13-22.5	**15**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Carbon Dioxide	SVM-13-22.5	**2.1**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Oxygen	SVM-13-7	**19**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Oxygen	SVM-13-15.5	**19**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Oxygen	SVM-14-22	**18**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Carbon Dioxide	SVM-14-22	**0.47**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Oxygen	SVM-14-7	**16**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Carbon Dioxide	SVM-14-7	**2.5**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Oxygen	SVM-14-15	**16**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Carbon Dioxide	SVM-14-15	**2.3**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Oxygen	SVM-14-15 DUP	**16**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
Carbon Dioxide	SVM-14-15 DUP	**2.3**	0.10	% by Volume	1	02/26/16	02/26/16	VOCs by GC/TCD
VOCs by EPA TO-3								
Gasoline Range Organics (GRO)	SVM-15-22	**310**	200	ug/L	10	02/24/16	02/24/16	TO-3
Gasoline Range Organics (GRO)	SVM-6-16	**31**	20	ug/L	1	02/24/16	02/24/16	TO-3
Gasoline Range Organics (GRO)	SVM-6-16 DUP	**33**	20	ug/L	1	02/24/16	02/24/16	TO-3
Gasoline Range Organics (GRO)	SVM-12-22	**3300**	2000	ug/L	100	02/25/16	02/25/16	TO-3
Gasoline Range Organics (GRO)	SVM-13-22.5	**74**	20	ug/L	1	02/26/16	02/26/16	TO-3

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
Gasoline Range Organics (GRO)	SVM-14-22	**9400**	2000	ug/L	100	02/26/16	02/26/16	TO-3
Gasoline Range Organics (GRO)	SVM-14-7	**1600**	1000	ug/L	50	02/26/16	02/26/16	TO-3
Gasoline Range Organics (GRO)	SVM-14-15	**4100**	2000	ug/L	100	02/26/16	02/26/16	TO-3
Gasoline Range Organics (GRO)	SVM-14-15 DUP	**4500**	2000	ug/L	100	02/26/16	02/26/16	TO-3
VOCs by GCMS EPA TO-15								
Benzene	SVM-15-22	**1.7**	0.80	ug/L	40	02/24/16	02/24/16	TO-15
Cyclohexane	SVM-15-22	**5.1**	0.80	ug/L	40	02/24/16	02/24/16	TO-15
n-Hexane	SVM-15-22	**3.1**	0.80	ug/L	40	02/24/16	02/24/16	TO-15
Toluene	SVM-15-22	**2.2**	0.80	ug/L	40	02/24/16	02/24/16	TO-15
1,3,5-Trimethylbenzene	SVM-15-22	**0.84**	0.80	ug/L	40	02/24/16	02/24/16	TO-15
2,2,4-Trimethylpentane	SVM-15-22	**49**	2.0	ug/L	100	02/24/16	02/24/16	TO-15
o-Xylene	SVM-15-22	**6.8**	0.80	ug/L	40	02/24/16	02/24/16	TO-15
m,p-Xylenes	SVM-15-22	**8.9**	0.80	ug/L	40	02/24/16	02/24/16	TO-15
Cyclohexane	SVM-6-16	**0.46**	0.040	ug/L	2	02/24/16	02/24/16	TO-15
n-Hexane	SVM-6-16	**0.43**	0.040	ug/L	2	02/24/16	02/24/16	TO-15
2,2,4-Trimethylpentane	SVM-6-16	**5.6**	0.20	ug/L	10	02/24/16	02/24/16	TO-15
Cyclohexane	SVM-6-16 DUP	**0.42**	0.080	ug/L	4	02/24/16	02/24/16	TO-15
n-Hexane	SVM-6-16 DUP	**0.41**	0.080	ug/L	4	02/24/16	02/24/16	TO-15
2,2,4-Trimethylpentane	SVM-6-16 DUP	**6.1**	0.20	ug/L	10	02/24/16	02/24/16	TO-15
2,2,4-Trimethylpentane	SVM-6-7	**0.088**	0.020	ug/L	1	02/24/16	02/24/16	TO-15
Cyclohexane	SVM-12-15	**0.034**	0.020	ug/L	1	02/25/16	02/25/16	TO-15
2,2,4-Trimethylpentane	SVM-12-15	**2.0**	0.10	ug/L	5	02/25/16	02/25/16	TO-15
Benzene	SVM-12-22	**10**	10	ug/L	500	02/25/16	02/25/16	TO-15
Cyclohexane	SVM-12-22	**60**	10	ug/L	500	02/25/16	02/25/16	TO-15
Heptane	SVM-12-22	**49**	10	ug/L	500	02/25/16	02/25/16	TO-15
n-Hexane	SVM-12-22	**67**	10	ug/L	500	02/25/16	02/25/16	TO-15

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
2,2,4-Trimethylpentane	SVM-12-22	**420**	20	ug/L	1000	02/25/16	02/25/16	TO-15
Cyclohexane	SVM-11-7	**0.13**	0.020	ug/L	1	02/26/16	02/26/16	TO-15
Cyclohexane	SVM-11-15	**0.038**	0.020	ug/L	1	02/26/16	02/26/16	TO-15
Cyclohexane	SVM-13-22.5	**1.8**	0.40	ug/L	20	02/26/16	02/26/16	TO-15
Heptane	SVM-13-22.5	**0.60**	0.40	ug/L	20	02/26/16	02/26/16	TO-15
n-Hexane	SVM-13-22.5	**3.8**	0.40	ug/L	20	02/26/16	02/26/16	TO-15
2,2,4-Trimethylpentane	SVM-13-22.5	**4.7**	0.40	ug/L	20	02/26/16	02/26/16	TO-15
Ethylbenzene	SVM-14-22	**170**	50	ug/L	2500	02/26/16	02/26/16	TO-15
4-Ethyltoluene	SVM-14-22	**100**	50	ug/L	2500	02/26/16	02/26/16	TO-15
Heptane	SVM-14-22	**130**	50	ug/L	2500	02/26/16	02/26/16	TO-15
Toluene	SVM-14-22	**730**	50	ug/L	2500	02/26/16	02/26/16	TO-15
1,2,4-Trimethylbenzene	SVM-14-22	**63**	50	ug/L	2500	02/26/16	02/26/16	TO-15
2,2,4-Trimethylpentane	SVM-14-22	**190**	50	ug/L	2500	02/26/16	02/26/16	TO-15
o-Xylene	SVM-14-22	**310**	50	ug/L	2500	02/26/16	02/26/16	TO-15
m,p-Xylenes	SVM-14-22	**1200**	200	ug/L	10000	02/26/16	02/26/16	TO-15
Cyclohexane	SVM-14-7	**14**	10	ug/L	500	02/26/16	02/26/16	TO-15
Heptane	SVM-14-7	**12**	10	ug/L	500	02/26/16	02/26/16	TO-15
2,2,4-Trimethylpentane	SVM-14-7	**78**	10	ug/L	500	02/26/16	02/26/16	TO-15
o-Xylene	SVM-14-7	**22**	10	ug/L	500	02/26/16	02/26/16	TO-15
m,p-Xylenes	SVM-14-7	**15**	10	ug/L	500	02/26/16	02/26/16	TO-15
Cyclohexane	SVM-14-15	**21**	20	ug/L	1000	02/26/16	02/26/16	TO-15
Heptane	SVM-14-15	**76**	20	ug/L	1000	02/26/16	02/26/16	TO-15
Toluene	SVM-14-15	**360**	20	ug/L	1000	02/26/16	02/26/16	TO-15
2,2,4-Trimethylpentane	SVM-14-15	**180**	20	ug/L	1000	02/26/16	02/26/16	TO-15
o-Xylene	SVM-14-15	**120**	20	ug/L	1000	02/26/16	02/26/16	TO-15
m,p-Xylenes	SVM-14-15	**240**	20	ug/L	1000	02/26/16	02/26/16	TO-15
Cyclohexane	SVM-14-15 DUP	**21**	20	ug/L	1000	02/26/16	02/26/16	TO-15
Heptane	SVM-14-15 DUP	**73**	20	ug/L	1000	02/26/16	02/26/16	TO-15
n-Hexane	SVM-14-15 DUP	**22**	20	ug/L	1000	02/26/16	02/26/16	TO-15
Toluene	SVM-14-15 DUP	**340**	20	ug/L	1000	02/26/16	02/26/16	TO-15
2,2,4-Trimethylpentane	SVM-14-15 DUP	**210**	20	ug/L	1000	02/26/16	02/26/16	TO-15

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

ANALYTICAL DATA SUMMARY

Analyte	Sample Name	Result	MRL	Units	Dilution	Prepared	Analyzed	Method
o-Xylene	SVM-14-15 DUP	**130**	20	ug/L	1000	02/26/16	02/26/16	TO-15
m,p-Xylenes	SVM-14-15 DUP	**260**	20	ug/L	1000	02/26/16	02/26/16	TO-15

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Prepared:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Analyzed:	02/24/16	02/24/16	02/24/16	02/24/16	
AA ID No:	6B29001-01	6B29001-02	6B29001-03	6B29001-04	
Client ID No:	SVM-1-15	SVM-1-5	SVM-2-5	SVM-15-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	99%	99%	102%	101%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Prepared:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Analyzed:	02/24/16	02/24/16	02/24/16	02/24/16	
AA ID No:	6B29001-05	6B29001-06	6B29001-07	6B29001-08	
Client ID No:	SVM-15-22	SVM-15-15	Ambient Air	SVM-6-16	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	10	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	**310**	<20	<20	**31**	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	87%	108%	94%	88%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Prepared:	02/24/16	02/24/16	02/24/16	02/25/16	
Date Analyzed:	02/24/16	02/24/16	02/24/16	02/25/16	
AA ID No:	6B29001-09	6B29001-10	6B29001-11	6B29001-12	
Client ID No:	SVM-6-16 DUP	SVM-6-7	SVM-7-7	SVM-7-13	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	**33**	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	89%	95%	103%	97%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/24/16	02/25/16	02/25/16	02/25/16	
Date Prepared:	02/24/16	02/25/16	02/25/16	02/25/16	
Date Analyzed:	02/24/16	02/25/16	02/25/16	02/25/16	
AA ID No:	6B29001-13	6B29001-14	6B29001-15	6B29001-16	
Client ID No:	SVM-10-15	SVM-5-15	SVM-5-5	SVM-8-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	100%	97%	95%	96%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187307
Project No:	496965.A1.01	**Date Received:**	02/26/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	03/11/16
Method:	VOCs by EPA TO-3	**Units:**	ug/L

Date Sampled:	02/25/2016	02/25/2016	02/25/2016	02/25/2016	
Date Prepared:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Analyzed:	02/25/16	02/25/16	02/25/16	02/25/16	
AA ID No:	6B29001-17	6B29001-18	6B29001-19	6B29001-20	
Client ID No:	SVM-8-5	SVM-16-22	SVM-16-22 DUP	SVM-16-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	95%	89%	91%	92%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187307
Project No:	496965.A1.01	**Date Received:**	02/26/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	03/11/16
Method:	VOCs by EPA TO-3	**Units:**	ug/L

Date Sampled:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Prepared:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Analyzed:	02/25/16	02/25/16	02/25/16	02/25/16	
AA ID No:	6B29001-21	6B29001-22	6B29001-23	6B29001-24	
Client ID No:	SVM-16-16	SVM-3-15	SVM-3-5	SVM-3-5 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	<20	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	96%	82%	93%	96%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Prepared:	02/25/16	02/26/16	02/25/16	02/25/16	
Date Analyzed:	02/25/16	02/26/16	02/25/16	02/25/16	
AA ID No:	6B29001-25	6B29001-26	6B29001-27	6B29001-28	
Client ID No:	SVM-12-15	Ambient Air	SVM-12-7	SVM-12-22	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	100	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	**3300**	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	94%	89%	100%	93%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Prepared:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Analyzed:	02/26/16	02/26/16	02/26/16	02/26/16	
AA ID No:	6B29001-29	6B29001-30	6B29001-31	6B29001-32	
Client ID No:	SVM-11-22	SVM-11-7	SVM-11-15	SVM-13-22.5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	<20	**74**	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	123%	97%	93%	97%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187307
Project No:	496965.A1.01	**Date Received:**	02/26/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	03/11/16
Method:	VOCs by EPA TO-3	**Units:**	ug/L

Date Sampled:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Prepared:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Analyzed:	02/26/16	02/26/16	02/26/16	02/26/16	
AA ID No:	6B29001-33	6B29001-34	6B29001-35	6B29001-36	
Client ID No:	SVM-13-7	SVM-13-15.5	SVM-14-22	SVM-14-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	100	50	MRL
TO-3 (TO-3)					
Gasoline Range Organics (GRO)	<20	<20	**9400**	**1600**	20
Surrogates					**%REC Limits**
4-Bromofluorobenzene	95%	90%	102%	100%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by EPA TO-3

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/26/16	02/26/16	02/26/16	
Date Prepared:	02/26/16	02/26/16	02/26/16	
Date Analyzed:	02/26/16	02/26/16	02/26/16	
AA ID No:	6B29001-37	6B29001-38	6B29001-39	
Client ID No:	SVM-14-15	SVM-14-15 DUP	Ambient Air	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	100	100	1	MRL
TO-3 (TO-3)				
Gasoline Range Organics (GRO)	**4100**	**4500**	<20	20
Surrogates				**%REC Limits**
4-Bromofluorobenzene	93%	90%	97%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187307
Project No:	496965.A1.01	**Date Received:**	02/26/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	03/11/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Prepared:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Analyzed:	02/24/16	02/24/16	02/24/16	02/24/16	
AA ID No:	6B29001-01	6B29001-02	6B29001-03	6B29001-04	
Client ID No:	SVM-1-15	SVM-1-5	SVM-2-5	SVM-15-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187307
Project No:	496965.A1.01	**Date Received:**	02/26/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	03/11/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Prepared:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Analyzed:	02/24/16	02/24/16	02/24/16	02/24/16	
AA ID No:	6B29001-01	6B29001-02	6B29001-03	6B29001-04	
Client ID No:	SVM-1-15	SVM-1-5	SVM-2-5	SVM-15-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Prepared:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Analyzed:	02/24/16	02/24/16	02/24/16	02/24/16	
AA ID No:	6B29001-01	6B29001-02	6B29001-03	6B29001-04	
Client ID No:	SVM-1-15	SVM-1-5	SVM-2-5	SVM-15-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	99%	99%	102%	101%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Prepared:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Analyzed:	02/24/16	02/24/16	02/24/16	02/24/16	
AA ID No:	6B29001-05	6B29001-06	6B29001-07	6B29001-08	
Client ID No:	SVM-15-22	SVM-15-15	Ambient Air	SVM-6-16	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	40	1	1	2	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.80	<0.020	<0.020	<0.040	0.020
Allyl chloride	<0.80	<0.020	<0.020	<0.040	0.020
tert-Amyl Methyl Ether (TAME)	<0.80	<0.020	<0.020	<0.040	0.020
Benzene	**1.7**	<0.020	<0.020	<0.040	0.020
Benzyl chloride	<0.80	<0.020	<0.020	<0.040	0.020
Bromodichloromethane	<0.80	<0.020	<0.020	<0.040	0.020
Bromoform	<0.80	<0.020	<0.020	<0.040	0.020
Bromomethane	<0.80	<0.020	<0.020	<0.040	0.020
1,3-Butadiene	<0.80	<0.020	<0.020	<0.040	0.020
2-Butanone (MEK)	<0.80	<0.020	<0.020	<0.040	0.020
tert-Butyl alcohol (TBA)	<800	<20	<20	<40	20
Carbon Disulfide	<0.80	<0.020	<0.020	<0.040	0.020
Carbon Tetrachloride	<0.80	<0.020	<0.020	<0.040	0.020
Chlorobenzene	<0.80	<0.020	<0.020	<0.040	0.020
Chloroethane	<0.80	<0.020	<0.020	<0.040	0.020
Chloroform	<0.80	<0.020	<0.020	<0.040	0.020
Chloromethane	<0.80	<0.020	<0.020	<0.040	0.020
Cyclohexane	**5.1**	<0.020	<0.020	**0.46**	0.020
Dibromochloromethane	<0.80	<0.020	<0.020	<0.040	0.020
1,2-Dibromoethane (EDB)	<0.80	<0.020	<0.020	<0.040	0.020
1,2-Dichlorobenzene	<0.80	<0.020	<0.020	<0.040	0.020
1,3-Dichlorobenzene	<0.80	<0.020	<0.020	<0.040	0.020
1,4-Dichlorobenzene	<0.80	<0.020	<0.020	<0.040	0.020
Dichlorodifluoromethane (R12)	<0.80	<0.020	<0.020	<0.040	0.020
1,1-Dichloroethane	<0.80	<0.020	<0.020	<0.040	0.020
1,2-Dichloroethane (EDC)	<0.80	<0.020	<0.020	<0.040	0.020
cis-1,2-Dichloroethylene	<0.80	<0.020	<0.020	<0.040	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Prepared:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Analyzed:	02/24/16	02/24/16	02/24/16	02/24/16	
AA ID No:	6B29001-05	6B29001-06	6B29001-07	6B29001-08	
Client ID No:	SVM-15-22	SVM-15-15	Ambient Air	SVM-6-16	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	40	1	1	2	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.80	<0.020	<0.020	<0.040	0.020
trans-1,2-Dichloroethylene	<0.80	<0.020	<0.020	<0.040	0.020
1,2-Dichloropropane	<0.80	<0.020	<0.020	<0.040	0.020
trans-1,3-Dichloropropylene	<0.80	<0.020	<0.020	<0.040	0.020
cis-1,3-Dichloropropylene	<0.80	<0.020	<0.020	<0.040	0.020
Dichlorotetrafluoroethane	<0.80	<0.020	<0.020	<0.040	0.020
Diisopropyl ether (DIPE)	<0.80	<0.020	<0.020	<0.040	0.020
1,4-Dioxane	<0.80	<0.020	<0.020	<0.040	0.020
Ethanol	<0.80	<0.020	<0.020	<0.040	0.020
Ethyl Acetate	<0.80	<0.020	<0.020	<0.040	0.020
Ethylbenzene	<0.80	<0.020	<0.020	<0.040	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.80	<0.020	<0.020	<0.040	0.020
4-Ethyltoluene	<0.80	<0.020	<0.020	<0.040	0.020
Heptane	<0.80	<0.020	<0.020	<0.040	0.020
Hexachlorobutadiene	<0.80	<0.020	<0.020	<0.040	0.020
n-Hexane	**3.1**	<0.020	<0.020	**0.43**	0.020
2-Hexanone (MBK)	<0.80	<0.020	<0.020	<0.040	0.020
Isopropanol (IPA)	<8.0	<0.20	<0.20	<0.40	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.80	<0.020	<0.020	<0.040	0.020
Methylene Chloride	<0.80	<0.020	<0.020	<0.040	0.020
4-Methyl-2-pentanone (MIBK)	<0.80	<0.020	<0.020	<0.040	0.020
Naphthalene	<0.80	<0.020	<0.020	<0.040	0.020
Propylene	<0.80	<0.020	<0.020	<0.040	0.020
Styrene	<0.80	<0.020	<0.020	<0.040	0.020
1,1,2,2-Tetrachloroethane	<0.80	<0.020	<0.020	<0.040	0.020
Tetrachloroethylene (PCE)	<0.80	<0.020	<0.020	<0.040	0.020
Tetrahydrofuran (THF)	<0.80	<0.020	<0.020	<0.040	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Prepared:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Analyzed:	02/24/16	02/24/16	02/24/16	02/24/16	
AA ID No:	6B29001-05	6B29001-06	6B29001-07	6B29001-08	
Client ID No:	SVM-15-22	SVM-15-15	Ambient Air	SVM-6-16	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	40	1	1	2	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	**2.2**	<0.020	<0.020	<0.040	0.020
1,2,4-Trichlorobenzene	<0.80	<0.020	<0.020	<0.040	0.020
1,1,2-Trichloroethane	<0.80	<0.020	<0.020	<0.040	0.020
1,1,1-Trichloroethane	<0.80	<0.020	<0.020	<0.040	0.020
Trichloroethylene (TCE)	<0.80	<0.020	<0.020	<0.040	0.020
Trichlorofluoromethane (R11)	<0.80	<0.020	<0.020	<0.040	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.80	<0.020	<0.020	<0.040	0.020
1,3,5-Trimethylbenzene	**0.84**	<0.020	<0.020	<0.040	0.020
1,2,4-Trimethylbenzene	<0.80	<0.020	<0.020	<0.040	0.020
2,2,4-Trimethylpentane	**49**	<0.020	<0.020	**5.6**	0.020
Vinyl acetate	<0.80	<0.020	<0.020	<0.040	0.020
Vinyl bromide	<0.80	<0.020	<0.020	<0.040	0.020
Vinyl chloride	<0.80	<0.020	<0.020	<0.040	0.020
o-Xylene	**6.8**	<0.020	<0.020	<0.040	0.020
m,p-Xylenes	**8.9**	<0.020	<0.020	<0.040	0.020
1,1,1,2-Tetrachloroethane	<0.80	<0.020	<0.020	<0.040	0.020
1,2,3-Trichloropropane	<0.80	<0.020	<0.020	<0.040	0.020
sec-Butylbenzene	<0.80	<0.020	<0.020	<0.040	0.020
Isopropylbenzene	<0.80	<0.020	<0.020	<0.040	0.020
n-Propylbenzene	<0.80	<0.020	<0.020	<0.040	0.020
4-Isopropyltoluene	<0.80	<0.020	<0.020	<0.040	0.020
n-Butylbenzene	<0.80	<0.020	<0.020	<0.040	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	92%	108%	94%	87%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Prepared:	02/24/16	02/24/16	02/24/16	02/25/16	
Date Analyzed:	02/24/16	02/24/16	02/24/16	02/25/16	
AA ID No:	6B29001-09	6B29001-10	6B29001-11	6B29001-12	
Client ID No:	SVM-6-16 DUP	SVM-6-7	SVM-7-7	SVM-7-13	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	4	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.080	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.080	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.080	<0.020	<0.020	<0.020	0.020
Benzene	<0.080	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.080	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.080	<0.020	<0.020	<0.020	0.020
Bromoform	<0.080	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.080	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.080	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.080	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<80	<20	<20	<20	20
Carbon Disulfide	<0.080	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.080	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.080	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.080	<0.020	<0.020	<0.020	0.020
Chloroform	<0.080	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.080	<0.020	<0.020	<0.020	0.020
Cyclohexane	**0.42**	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.080	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.080	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.080	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.080	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.080	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.080	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.080	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.080	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.080	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Prepared:	02/24/16	02/24/16	02/24/16	02/25/16	
Date Analyzed:	02/24/16	02/24/16	02/24/16	02/25/16	
AA ID No:	6B29001-09	6B29001-10	6B29001-11	6B29001-12	
Client ID No:	SVM-6-16 DUP	SVM-6-7	SVM-7-7	SVM-7-13	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	4	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.080	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.080	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.080	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.080	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.080	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.080	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.080	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.080	<0.020	<0.020	<0.020	0.020
Ethanol	<0.080	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.080	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.080	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.080	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.080	<0.020	<0.020	<0.020	0.020
Heptane	<0.080	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.080	<0.020	<0.020	<0.020	0.020
n-Hexane	**0.41**	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.080	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.80	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.080	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.080	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.080	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.080	<0.020	<0.020	<0.020	0.020
Propylene	<0.080	<0.020	<0.020	<0.020	0.020
Styrene	<0.080	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.080	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.080	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.080	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Prepared:	02/24/16	02/24/16	02/24/16	02/25/16	
Date Analyzed:	02/24/16	02/24/16	02/24/16	02/25/16	
AA ID No:	6B29001-09	6B29001-10	6B29001-11	6B29001-12	
Client ID No:	SVM-6-16 DUP	SVM-6-7	SVM-7-7	SVM-7-13	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	4	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.080	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.080	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.080	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.080	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.080	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.080	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.080	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.080	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.080	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	**6.1**	**0.088**	<0.020	<0.020	0.020
Vinyl acetate	<0.080	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.080	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.080	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.080	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.080	<0.020	<0.020	<0.020	0.020
1,1,1,2-Tetrachloroethane	<0.080	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.080	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.080	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.080	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.080	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.080	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.080	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	96%	95%	103%	97%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/24/16	02/25/16	02/25/16	02/25/16	
Date Prepared:	02/24/16	02/25/16	02/25/16	02/25/16	
Date Analyzed:	02/24/16	02/25/16	02/25/16	02/25/16	
AA ID No:	6B29001-13	6B29001-14	6B29001-15	6B29001-16	
Client ID No:	SVM-10-15	SVM-5-15	SVM-5-5	SVM-8-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/24/16	02/25/16	02/25/16	02/25/16	
Date Prepared:	02/24/16	02/25/16	02/25/16	02/25/16	
Date Analyzed:	02/24/16	02/25/16	02/25/16	02/25/16	
AA ID No:	6B29001-13	6B29001-14	6B29001-15	6B29001-16	
Client ID No:	SVM-10-15	SVM-5-15	SVM-5-5	SVM-8-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/24/16	02/25/16	02/25/16	02/25/16	
Date Prepared:	02/24/16	02/25/16	02/25/16	02/25/16	
Date Analyzed:	02/24/16	02/25/16	02/25/16	02/25/16	
AA ID No:	6B29001-13	6B29001-14	6B29001-15	6B29001-16	
Client ID No:	SVM-10-15	SVM-5-15	SVM-5-5	SVM-8-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	100%	97%	95%	96%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187307
Project No:	496965.A1.01	**Date Received:**	02/26/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	03/11/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	02/25/2016	02/25/2016	02/25/2016	02/25/2016	
Date Prepared:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Analyzed:	02/25/16	02/25/16	02/25/16	02/25/16	
AA ID No:	6B29001-17	6B29001-18	6B29001-19	6B29001-20	
Client ID No:	SVM-8-5	SVM-16-22	SVM-16-22 DUP	SVM-16-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/25/2016	02/25/2016	02/25/2016	02/25/2016	
Date Prepared:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Analyzed:	02/25/16	02/25/16	02/25/16	02/25/16	
AA ID No:	6B29001-17	6B29001-18	6B29001-19	6B29001-20	
Client ID No:	SVM-8-5	SVM-16-22	SVM-16-22 DUP	SVM-16-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/25/2016	02/25/2016	02/25/2016	02/25/2016	
Date Prepared:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Analyzed:	02/25/16	02/25/16	02/25/16	02/25/16	
AA ID No:	6B29001-17	6B29001-18	6B29001-19	6B29001-20	
Client ID No:	SVM-8-5	SVM-16-22	SVM-16-22 DUP	SVM-16-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	95%	89%	91%	92%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Prepared:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Analyzed:	02/25/16	02/25/16	02/25/16	02/25/16	
AA ID No:	6B29001-21	6B29001-22	6B29001-23	6B29001-24	
Client ID No:	SVM-16-16	SVM-3-15	SVM-3-5	SVM-3-5 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.020	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.020	0.020
Benzene	<0.020	<0.020	<0.020	<0.020	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Bromoform	<0.020	<0.020	<0.020	<0.020	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.020	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.020	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<20	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.020	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.020	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Chloroform	<0.020	<0.020	<0.020	<0.020	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.020	0.020
Cyclohexane	<0.020	<0.020	<0.020	<0.020	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.020	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Prepared:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Analyzed:	02/25/16	02/25/16	02/25/16	02/25/16	
AA ID No:	6B29001-21	6B29001-22	6B29001-23	6B29001-24	
Client ID No:	SVM-16-16	SVM-3-15	SVM-3-5	SVM-3-5 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.020	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.020	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.020	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.020	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.020	0.020
Ethanol	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.020	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.020	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
Heptane	<0.020	<0.020	<0.020	<0.020	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.020	0.020
n-Hexane	<0.020	<0.020	<0.020	<0.020	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.020	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.020	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.020	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.020	0.020
Propylene	<0.020	<0.020	<0.020	<0.020	0.020
Styrene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.020	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Prepared:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Analyzed:	02/25/16	02/25/16	02/25/16	02/25/16	
AA ID No:	6B29001-21	6B29001-22	6B29001-23	6B29001-24	
Client ID No:	SVM-16-16	SVM-3-15	SVM-3-5	SVM-3-5 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.020	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.020	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<0.020	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.020	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<0.020	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.020	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.020	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.020	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.020	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.020	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.020	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	96%	82%	93%	96%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187307
Project No:	496965.A1.01	**Date Received:**	02/26/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	03/11/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Prepared:	02/25/16	02/26/16	02/25/16	02/25/16	
Date Analyzed:	02/25/16	02/26/16	02/25/16	02/25/16	
AA ID No:	6B29001-25	6B29001-26	6B29001-27	6B29001-28	
Client ID No:	SVM-12-15	Ambient Air	SVM-12-7	SVM-12-22	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	500	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<10	0.020
Allyl chloride	<0.020	<0.020	<0.020	<10	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<10	0.020
Benzene	<0.020	<0.020	<0.020	**10**	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<10	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<10	0.020
Bromoform	<0.020	<0.020	<0.020	<10	0.020
Bromomethane	<0.020	<0.020	<0.020	<10	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<10	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<10	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<10000	20
Carbon Disulfide	<0.020	<0.020	<0.020	<10	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<10	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<10	0.020
Chloroethane	<0.020	<0.020	<0.020	<10	0.020
Chloroform	<0.020	<0.020	<0.020	<10	0.020
Chloromethane	<0.020	<0.020	<0.020	<10	0.020
Cyclohexane	**0.034**	<0.020	<0.020	**60**	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<10	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<10	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<10	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<10	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<10	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<10	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<10	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<10	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<10	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Prepared:	02/25/16	02/26/16	02/25/16	02/25/16	
Date Analyzed:	02/25/16	02/26/16	02/25/16	02/25/16	
AA ID No:	6B29001-25	6B29001-26	6B29001-27	6B29001-28	
Client ID No:	SVM-12-15	Ambient Air	SVM-12-7	SVM-12-22	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	500	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<10	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<10	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<10	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<10	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<10	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<10	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<10	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<10	0.020
Ethanol	<0.020	<0.020	<0.020	<10	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<10	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<10	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<10	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<10	0.020
Heptane	<0.020	<0.020	<0.020	**49**	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<10	0.020
n-Hexane	<0.020	<0.020	<0.020	**67**	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<10	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<100	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<10	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<10	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<10	0.020
Naphthalene	<0.020	<0.020	<0.020	<10	0.020
Propylene	<0.020	<0.020	<0.020	<10	0.020
Styrene	<0.020	<0.020	<0.020	<10	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<10	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<10	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<10	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187307
Project No:	496965.A1.01	**Date Received:**	02/26/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	03/11/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Prepared:	02/25/16	02/26/16	02/25/16	02/25/16	
Date Analyzed:	02/25/16	02/26/16	02/25/16	02/25/16	
AA ID No:	6B29001-25	6B29001-26	6B29001-27	6B29001-28	
Client ID No:	SVM-12-15	Ambient Air	SVM-12-7	SVM-12-22	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	500	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<10	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<10	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<10	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<10	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<10	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<10	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<10	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<10	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<10	0.020
2,2,4-Trimethylpentane	**2.0**	<0.020	<0.020	**420**	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<10	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<10	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<10	0.020
o-Xylene	<0.020	<0.020	<0.020	<10	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<10	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<10	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<10	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<10	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<10	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<10	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<10	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<10	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	90%	89%	100%	96%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Prepared:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Analyzed:	02/26/16	02/26/16	02/26/16	02/26/16	
AA ID No:	6B29001-29	6B29001-30	6B29001-31	6B29001-32	
Client ID No:	SVM-11-22	SVM-11-7	SVM-11-15	SVM-13-22.5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	20	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<0.020	<0.40	0.020
Allyl chloride	<0.020	<0.020	<0.020	<0.40	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<0.020	<0.40	0.020
Benzene	<0.020	<0.020	<0.020	<0.40	0.020
Benzyl chloride	<0.020	<0.020	<0.020	<0.40	0.020
Bromodichloromethane	<0.020	<0.020	<0.020	<0.40	0.020
Bromoform	<0.020	<0.020	<0.020	<0.40	0.020
Bromomethane	<0.020	<0.020	<0.020	<0.40	0.020
1,3-Butadiene	<0.020	<0.020	<0.020	<0.40	0.020
2-Butanone (MEK)	<0.020	<0.020	<0.020	<0.40	0.020
tert-Butyl alcohol (TBA)	<20	<20	<20	<400	20
Carbon Disulfide	<0.020	<0.020	<0.020	<0.40	0.020
Carbon Tetrachloride	<0.020	<0.020	<0.020	<0.40	0.020
Chlorobenzene	<0.020	<0.020	<0.020	<0.40	0.020
Chloroethane	<0.020	<0.020	<0.020	<0.40	0.020
Chloroform	<0.020	<0.020	<0.020	<0.40	0.020
Chloromethane	<0.020	<0.020	<0.020	<0.40	0.020
Cyclohexane	<0.020	**0.13**	**0.038**	**1.8**	0.020
Dibromochloromethane	<0.020	<0.020	<0.020	<0.40	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<0.020	<0.40	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<0.020	<0.40	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<0.020	<0.40	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<0.020	<0.40	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<0.020	<0.40	0.020
1,1-Dichloroethane	<0.020	<0.020	<0.020	<0.40	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<0.020	<0.40	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.40	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Prepared:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Analyzed:	02/26/16	02/26/16	02/26/16	02/26/16	
AA ID No:	6B29001-29	6B29001-30	6B29001-31	6B29001-32	
Client ID No:	SVM-11-22	SVM-11-7	SVM-11-15	SVM-13-22.5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	20	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<0.020	<0.40	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<0.020	<0.40	0.020
1,2-Dichloropropane	<0.020	<0.020	<0.020	<0.40	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.40	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<0.020	<0.40	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<0.020	<0.40	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<0.020	<0.40	0.020
1,4-Dioxane	<0.020	<0.020	<0.020	<0.40	0.020
Ethanol	<0.020	<0.020	<0.020	<0.40	0.020
Ethyl Acetate	<0.020	<0.020	<0.020	<0.40	0.020
Ethylbenzene	<0.020	<0.020	<0.020	<0.40	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<0.020	<0.40	0.020
4-Ethyltoluene	<0.020	<0.020	<0.020	<0.40	0.020
Heptane	<0.020	<0.020	<0.020	**0.60**	0.020
Hexachlorobutadiene	<0.020	<0.020	<0.020	<0.40	0.020
n-Hexane	<0.020	<0.020	<0.020	**3.8**	0.020
2-Hexanone (MBK)	<0.020	<0.020	<0.020	<0.40	0.020
Isopropanol (IPA)	<0.20	<0.20	<0.20	<4.0	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<0.020	<0.40	0.020
Methylene Chloride	<0.020	<0.020	<0.020	<0.40	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<0.020	<0.40	0.020
Naphthalene	<0.020	<0.020	<0.020	<0.40	0.020
Propylene	<0.020	<0.020	<0.020	<0.40	0.020
Styrene	<0.020	<0.020	<0.020	<0.40	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.40	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<0.020	<0.40	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<0.020	<0.40	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Prepared:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Analyzed:	02/26/16	02/26/16	02/26/16	02/26/16	
AA ID No:	6B29001-29	6B29001-30	6B29001-31	6B29001-32	
Client ID No:	SVM-11-22	SVM-11-7	SVM-11-15	SVM-13-22.5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	20	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	<0.020	<0.40	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<0.020	<0.40	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<0.020	<0.40	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<0.020	<0.40	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<0.020	<0.40	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<0.020	<0.40	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<0.020	<0.40	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<0.020	<0.40	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	<0.020	<0.40	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	<0.020	**4.7**	0.020
Vinyl acetate	<0.020	<0.020	<0.020	<0.40	0.020
Vinyl bromide	<0.020	<0.020	<0.020	<0.40	0.020
Vinyl chloride	<0.020	<0.020	<0.020	<0.40	0.020
o-Xylene	<0.020	<0.020	<0.020	<0.40	0.020
m,p-Xylenes	<0.020	<0.020	<0.020	<0.40	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<0.020	<0.40	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<0.020	<0.40	0.020
sec-Butylbenzene	<0.020	<0.020	<0.020	<0.40	0.020
Isopropylbenzene	<0.020	<0.020	<0.020	<0.40	0.020
n-Propylbenzene	<0.020	<0.020	<0.020	<0.40	0.020
4-Isopropyltoluene	<0.020	<0.020	<0.020	<0.40	0.020
n-Butylbenzene	<0.020	<0.020	<0.020	<0.40	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	93%	97%	79%	97%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Prepared:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Analyzed:	02/26/16	02/26/16	02/26/16	02/26/16	
AA ID No:	6B29001-33	6B29001-34	6B29001-35	6B29001-36	
Client ID No:	SVM-13-7	SVM-13-15.5	SVM-14-22	SVM-14-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	2500	500	MRL
TO-15 (Mid Level) (TO-15)					
Acetone	<0.020	<0.020	<50	<10	0.020
Allyl chloride	<0.020	<0.020	<50	<10	0.020
tert-Amyl Methyl Ether (TAME)	<0.020	<0.020	<50	<10	0.020
Benzene	<0.020	<0.020	<50	<10	0.020
Benzyl chloride	<0.020	<0.020	<50	<10	0.020
Bromodichloromethane	<0.020	<0.020	<50	<10	0.020
Bromoform	<0.020	<0.020	<50	<10	0.020
Bromomethane	<0.020	<0.020	<50	<10	0.020
1,3-Butadiene	<0.020	<0.020	<50	<10	0.020
2-Butanone (MEK)	<0.020	<0.020	<50	<10	0.020
tert-Butyl alcohol (TBA)	<20	<20	<50000	<10000	20
Carbon Disulfide	<0.020	<0.020	<50	<10	0.020
Carbon Tetrachloride	<0.020	<0.020	<50	<10	0.020
Chlorobenzene	<0.020	<0.020	<50	<10	0.020
Chloroethane	<0.020	<0.020	<50	<10	0.020
Chloroform	<0.020	<0.020	<50	<10	0.020
Chloromethane	<0.020	<0.020	<50	<10	0.020
Cyclohexane	<0.020	<0.020	<50	**14**	0.020
Dibromochloromethane	<0.020	<0.020	<50	<10	0.020
1,2-Dibromoethane (EDB)	<0.020	<0.020	<50	<10	0.020
1,2-Dichlorobenzene	<0.020	<0.020	<50	<10	0.020
1,3-Dichlorobenzene	<0.020	<0.020	<50	<10	0.020
1,4-Dichlorobenzene	<0.020	<0.020	<50	<10	0.020
Dichlorodifluoromethane (R12)	<0.020	<0.020	<50	<10	0.020
1,1-Dichloroethane	<0.020	<0.020	<50	<10	0.020
1,2-Dichloroethane (EDC)	<0.020	<0.020	<50	<10	0.020
cis-1,2-Dichloroethylene	<0.020	<0.020	<50	<10	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Prepared:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Analyzed:	02/26/16	02/26/16	02/26/16	02/26/16	
AA ID No:	6B29001-33	6B29001-34	6B29001-35	6B29001-36	
Client ID No:	SVM-13-7	SVM-13-15.5	SVM-14-22	SVM-14-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	2500	500	MRL
TO-15 (Mid Level) (TO-15) (continued)					
1,1-Dichloroethylene	<0.020	<0.020	<50	<10	0.020
trans-1,2-Dichloroethylene	<0.020	<0.020	<50	<10	0.020
1,2-Dichloropropane	<0.020	<0.020	<50	<10	0.020
trans-1,3-Dichloropropylene	<0.020	<0.020	<50	<10	0.020
cis-1,3-Dichloropropylene	<0.020	<0.020	<50	<10	0.020
Dichlorotetrafluoroethane	<0.020	<0.020	<50	<10	0.020
Diisopropyl ether (DIPE)	<0.020	<0.020	<50	<10	0.020
1,4-Dioxane	<0.020	<0.020	<50	<10	0.020
Ethanol	<0.020	<0.020	<50	<10	0.020
Ethyl Acetate	<0.020	<0.020	<50	<10	0.020
Ethylbenzene	<0.020	<0.020	**170**	<10	0.020
Ethyl-tert-Butyl Ether (ETBE)	<0.020	<0.020	<50	<10	0.020
4-Ethyltoluene	<0.020	<0.020	**100**	<10	0.020
Heptane	<0.020	<0.020	**130**	**12**	0.020
Hexachlorobutadiene	<0.020	<0.020	<50	<10	0.020
n-Hexane	<0.020	<0.020	<50	<10	0.020
2-Hexanone (MBK)	<0.020	<0.020	<50	<10	0.020
Isopropanol (IPA)	<0.20	<0.20	<500	<100	0.20
Methyl-tert-Butyl Ether (MTBE)	<0.020	<0.020	<50	<10	0.020
Methylene Chloride	<0.020	<0.020	<50	<10	0.020
4-Methyl-2-pentanone (MIBK)	<0.020	<0.020	<50	<10	0.020
Naphthalene	<0.020	<0.020	<50	<10	0.020
Propylene	<0.020	<0.020	<50	<10	0.020
Styrene	<0.020	<0.020	<50	<10	0.020
1,1,2,2-Tetrachloroethane	<0.020	<0.020	<50	<10	0.020
Tetrachloroethylene (PCE)	<0.020	<0.020	<50	<10	0.020
Tetrahydrofuran (THF)	<0.020	<0.020	<50	<10	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187307
Project No:	496965.A1.01	**Date Received:**	02/26/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	03/11/16
Method:	VOCs by GCMS EPA TO-15	**Units:**	ug/L

Date Sampled:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Prepared:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Analyzed:	02/26/16	02/26/16	02/26/16	02/26/16	
AA ID No:	6B29001-33	6B29001-34	6B29001-35	6B29001-36	
Client ID No:	SVM-13-7	SVM-13-15.5	SVM-14-22	SVM-14-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	2500	500	MRL
TO-15 (Mid Level) (TO-15) (continued)					
Toluene	<0.020	<0.020	**730**	<10	0.020
1,2,4-Trichlorobenzene	<0.020	<0.020	<50	<10	0.020
1,1,2-Trichloroethane	<0.020	<0.020	<50	<10	0.020
1,1,1-Trichloroethane	<0.020	<0.020	<50	<10	0.020
Trichloroethylene (TCE)	<0.020	<0.020	<50	<10	0.020
Trichlorofluoromethane (R11)	<0.020	<0.020	<50	<10	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	<0.020	<50	<10	0.020
1,3,5-Trimethylbenzene	<0.020	<0.020	<50	<10	0.020
1,2,4-Trimethylbenzene	<0.020	<0.020	**63**	<10	0.020
2,2,4-Trimethylpentane	<0.020	<0.020	**190**	**78**	0.020
Vinyl acetate	<0.020	<0.020	<50	<10	0.020
Vinyl bromide	<0.020	<0.020	<50	<10	0.020
Vinyl chloride	<0.020	<0.020	<50	<10	0.020
o-Xylene	<0.020	<0.020	**310**	**22**	0.020
m,p-Xylenes	<0.020	<0.020	**1200**	**15**	0.020
1,1,1,2-Tetrachloroethane	<0.020	<0.020	<50	<10	0.020
1,2,3-Trichloropropane	<0.020	<0.020	<50	<10	0.020
sec-Butylbenzene	<0.020	<0.020	<50	<10	0.020
Isopropylbenzene	<0.020	<0.020	<50	<10	0.020
n-Propylbenzene	<0.020	<0.020	<50	<10	0.020
4-Isopropyltoluene	<0.020	<0.020	<50	<10	0.020
n-Butylbenzene	<0.020	<0.020	<50	<10	0.020
Surrogates					**%REC Limits**
4-Bromofluorobenzene	95%	90%	99%	100%	70-130

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/26/16	02/26/16	02/26/16	
Date Prepared:	02/26/16	02/26/16	02/26/16	
Date Analyzed:	02/26/16	02/26/16	02/26/16	
AA ID No:	6B29001-37	6B29001-38	6B29001-39	
Client ID No:	SVM-14-15	SVM-14-15 DUP	Ambient Air	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1000	1000	1	MRL
TO-15 (Mid Level) (TO-15)				
Acetone	<20	<20	<0.020	0.020
Allyl chloride	<20	<20	<0.020	0.020
tert-Amyl Methyl Ether (TAME)	<20	<20	<0.020	0.020
Benzene	<20	<20	<0.020	0.020
Benzyl chloride	<20	<20	<0.020	0.020
Bromodichloromethane	<20	<20	<0.020	0.020
Bromoform	<20	<20	<0.020	0.020
Bromomethane	<20	<20	<0.020	0.020
1,3-Butadiene	<20	<20	<0.020	0.020
2-Butanone (MEK)	<20	<20	<0.020	0.020
tert-Butyl alcohol (TBA)	<20000	<20000	<20	20
Carbon Disulfide	<20	<20	<0.020	0.020
Carbon Tetrachloride	<20	<20	<0.020	0.020
Chlorobenzene	<20	<20	<0.020	0.020
Chloroethane	<20	<20	<0.020	0.020
Chloroform	<20	<20	<0.020	0.020
Chloromethane	<20	<20	<0.020	0.020
Cyclohexane	**21**	**21**	<0.020	0.020
Dibromochloromethane	<20	<20	<0.020	0.020
1,2-Dibromoethane (EDB)	<20	<20	<0.020	0.020
1,2-Dichlorobenzene	<20	<20	<0.020	0.020
1,3-Dichlorobenzene	<20	<20	<0.020	0.020
1,4-Dichlorobenzene	<20	<20	<0.020	0.020
Dichlorodifluoromethane (R12)	<20	<20	<0.020	0.020
1,1-Dichloroethane	<20	<20	<0.020	0.020
1,2-Dichloroethane (EDC)	<20	<20	<0.020	0.020
cis-1,2-Dichloroethylene	<20	<20	<0.020	0.020

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/26/16	02/26/16	02/26/16	
Date Prepared:	02/26/16	02/26/16	02/26/16	
Date Analyzed:	02/26/16	02/26/16	02/26/16	
AA ID No:	6B29001-37	6B29001-38	6B29001-39	
Client ID No:	SVM-14-15	SVM-14-15 DUP	Ambient Air	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1000	1000	1	MRL
TO-15 (Mid Level) (TO-15) (continued)				
1,1-Dichloroethylene	<20	<20	<0.020	0.020
trans-1,2-Dichloroethylene	<20	<20	<0.020	0.020
1,2-Dichloropropane	<20	<20	<0.020	0.020
trans-1,3-Dichloropropylene	<20	<20	<0.020	0.020
cis-1,3-Dichloropropylene	<20	<20	<0.020	0.020
Dichlorotetrafluoroethane	<20	<20	<0.020	0.020
Diisopropyl ether (DIPE)	<20	<20	<0.020	0.020
1,4-Dioxane	<20	<20	<0.020	0.020
Ethanol	<20	<20	<0.020	0.020
Ethyl Acetate	<20	<20	<0.020	0.020
Ethylbenzene	<20	<20	<0.020	0.020
Ethyl-tert-Butyl Ether (ETBE)	<20	<20	<0.020	0.020
4-Ethyltoluene	<20	<20	<0.020	0.020
Heptane	**76**	**73**	<0.020	0.020
Hexachlorobutadiene	<20	<20	<0.020	0.020
n-Hexane	<20	**22**	<0.020	0.020
2-Hexanone (MBK)	<20	<20	<0.020	0.020
Isopropanol (IPA)	<200	<200	<0.20	0.20
Methyl-tert-Butyl Ether (MTBE)	<20	<20	<0.020	0.020
Methylene Chloride	<20	<20	<0.020	0.020
4-Methyl-2-pentanone (MIBK)	<20	<20	<0.020	0.020
Naphthalene	<20	<20	<0.020	0.020
Propylene	<20	<20	<0.020	0.020
Styrene	<20	<20	<0.020	0.020
1,1,2,2-Tetrachloroethane	<20	<20	<0.020	0.020
Tetrachloroethylene (PCE)	<20	<20	<0.020	0.020
Tetrahydrofuran (THF)	<20	<20	<0.020	0.020

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Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: VOCs by GCMS EPA TO-15

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: ug/L

Date Sampled:	02/26/16	02/26/16	02/26/16	
Date Prepared:	02/26/16	02/26/16	02/26/16	
Date Analyzed:	02/26/16	02/26/16	02/26/16	
AA ID No:	6B29001-37	6B29001-38	6B29001-39	
Client ID No:	SVM-14-15	SVM-14-15 DUP	Ambient Air	
Matrix:	Vapor	Vapor	Vapor	
Dilution Factor:	1000	1000	1	MRL
TO-15 (Mid Level) (TO-15) (continued)				
Toluene	**360**	**340**	<0.020	0.020
1,2,4-Trichlorobenzene	<20	<20	<0.020	0.020
1,1,2-Trichloroethane	<20	<20	<0.020	0.020
1,1,1-Trichloroethane	<20	<20	<0.020	0.020
Trichloroethylene (TCE)	<20	<20	<0.020	0.020
Trichlorofluoromethane (R11)	<20	<20	<0.020	0.020
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<20	<20	<0.020	0.020
1,3,5-Trimethylbenzene	<20	<20	<0.020	0.020
1,2,4-Trimethylbenzene	<20	<20	<0.020	0.020
2,2,4-Trimethylpentane	**180**	**210**	<0.020	0.020
Vinyl acetate	<20	<20	<0.020	0.020
Vinyl bromide	<20	<20	<0.020	0.020
Vinyl chloride	<20	<20	<0.020	0.020
o-Xylene	**120**	**130**	<0.020	0.020
m,p-Xylenes	**240**	**260**	<0.020	0.020
1,1,1,2-Tetrachloroethane	<20	<20	<0.020	0.020
1,2,3-Trichloropropane	<20	<20	<0.020	0.020
sec-Butylbenzene	<20	<20	<0.020	0.020
Isopropylbenzene	<20	<20	<0.020	0.020
n-Propylbenzene	<20	<20	<0.020	0.020
4-Isopropyltoluene	<20	<20	<0.020	0.020
n-Butylbenzene	<20	<20	<0.020	0.020
Surrogates				**%REC Limits**
4-Bromofluorobenzene	93%	90%	97%	70-130

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LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187307
Project No:	496965.A1.01	**Date Received:**	02/26/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	03/11/16
Method:	Fixed Gases by TCD	**Units:**	% by Volume

Date Sampled:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Prepared:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Analyzed:	02/24/16	02/24/16	02/24/16	02/24/16	
AA ID No:	6B29001-01	6B29001-02	6B29001-03	6B29001-04	
Client ID No:	SVM-1-15	SVM-1-5	SVM-2-5	SVM-15-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**19**	**19**	**19**	**19**	0.10
Carbon Dioxide	<0.10	**0.24**	<0.10	<0.10	0.10

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LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: % by Volume

Date Sampled:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Prepared:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Analyzed:	02/24/16	02/24/16	02/24/16	02/24/16	
AA ID No:	6B29001-05	6B29001-06	6B29001-08	6B29001-09	
Client ID No:	SVM-15-22	SVM-15-15	SVM-6-16	SVM-6-16 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**17**	**19**	**19**	**19**	0.10
Carbon Dioxide	**1.1**	<0.10	<0.10	<0.10	0.10

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LABORATORY ANALYSIS RESULTS

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Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: % by Volume

Date Sampled:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Prepared:	02/24/16	02/24/16	02/24/16	02/24/16	
Date Analyzed:	02/24/16	02/24/16	02/24/16	02/24/16	
AA ID No:	6B29001-10	6B29001-11	6B29001-12	6B29001-13	
Client ID No:	SVM-6-7	SVM-7-7	SVM-7-13	SVM-10-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**19**	**19**	**19**	**17**	0.10
Carbon Dioxide	<0.10	**0.12**	**0.18**	**3.7**	0.10

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Project No: 496965.A1.01
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Method: Fixed Gases by TCD

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: % by Volume

Date Sampled:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Prepared:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Analyzed:	02/25/16	02/25/16	02/25/16	02/25/16	
AA ID No:	6B29001-14	6B29001-15	6B29001-16	6B29001-17	
Client ID No:	SVM-5-15	SVM-5-5	SVM-8-15	SVM-8-5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**19**	**19**	**19**	**19**	0.10
Carbon Dioxide	<0.10	<0.10	**0.10**	**0.11**	0.10

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LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187307
Project No:	496965.A1.01	**Date Received:**	02/26/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	03/11/16
Method:	Fixed Gases by TCD	**Units:**	% by Volume

Date Sampled:	02/25/2016	02/25/2016	02/25/2016	02/25/2016	
Date Prepared:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Analyzed:	02/25/16	02/25/16	02/25/16	02/25/16	
AA ID No:	6B29001-18	6B29001-19	6B29001-20	6B29001-21	
Client ID No:	SVM-16-22	SVM-16-22 DUP	SVM-16-7	SVM-16-16	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**11**	**11**	**19**	**18**	0.10
Carbon Dioxide	**5.9**	**5.7**	**0.16**	**0.53**	0.10

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LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup
Method: Fixed Gases by TCD

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: % by Volume

Date Sampled:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Prepared:	02/25/16	02/25/16	02/25/16	02/25/16	
Date Analyzed:	02/25/16	02/25/16	02/25/16	02/25/16	
AA ID No:	6B29001-22	6B29001-23	6B29001-24	6B29001-25	
Client ID No:	SVM-3-15	SVM-3-5	SVM-3-5 DUP	SVM-12-15	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**18**	**19**	**18**	**11**	0.10
Carbon Dioxide	**0.14**	**0.14**	**0.14**	**1.5**	0.10

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Project No: 496965.A1.01
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Method: Fixed Gases by TCD

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16
Units: % by Volume

Date Sampled:	02/25/16	02/25/16	02/26/16	02/26/16	
Date Prepared:	02/25/16	02/25/16	02/26/16	02/26/16	
Date Analyzed:	02/25/16	02/25/16	02/26/16	02/26/16	
AA ID No:	6B29001-27	6B29001-28	6B29001-29	6B29001-30	
Client ID No:	SVM-12-7	SVM-12-22	SVM-11-22	SVM-11-7	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**17**	**1.1**	**19**	**18**	0.10
Carbon Dioxide	**0.35**	**11**	**0.26**	**0.17**	0.10

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Client:	CH2M Hill, Inc.	**AA Project No:**	MB187307
Project No:	496965.A1.01	**Date Received:**	02/26/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	03/11/16
Method:	Fixed Gases by TCD	**Units:**	% by Volume

Date Sampled:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Prepared:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Analyzed:	02/26/16	02/26/16	02/26/16	02/26/16	
AA ID No:	6B29001-31	6B29001-32	6B29001-33	6B29001-34	
Client ID No:	SVM-11-15	SVM-13-22.5	SVM-13-7	SVM-13-15.5	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**15**	**15**	**19**	**19**	0.10
Carbon Dioxide	**0.28**	**2.1**	<0.10	<0.10	0.10

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Client:	CH2M Hill, Inc.	**AA Project No:**	MB187307
Project No:	496965.A1.01	**Date Received:**	02/26/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	03/11/16
Method:	Fixed Gases by TCD	**Units:**	% by Volume

Date Sampled:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Prepared:	02/26/16	02/26/16	02/26/16	02/26/16	
Date Analyzed:	02/26/16	02/26/16	02/26/16	02/26/16	
AA ID No:	6B29001-35	6B29001-36	6B29001-37	6B29001-38	
Client ID No:	SVM-14-22	SVM-14-7	SVM-14-15	SVM-14-15 DUP	
Matrix:	Vapor	Vapor	Vapor	Vapor	
Dilution Factor:	1	1	1	1	MRL
Fixed Gases - Field (VOCs by GC/TCD)					
Methane	<0.10	<0.10	<0.10	<0.10	0.10
Oxygen	**18**	**16**	**16**	**16**	0.10
Carbon Dioxide	**0.47**	**2.5**	**2.3**	**2.3**	0.10

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Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by EPA TO-3 - Quality Control										
*Batch B6C0830 - *** DEFAULT PREP ****										
Blank (B6C0830-BLK1)				Prepared & Analyzed: 02/24/16						
Gasoline Range Organics (GRO)	<20	20	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.137*		*ug/L*	*0.14*		*95.6*	*70-130*			
LCS (B6C0830-BS1)				Prepared & Analyzed: 02/24/16						
Gasoline Range Organics (GRO)	**0.793**	20	ug/L	0.82		97.0	70-130			
Surrogate: 4-Bromofluorobenzene	*0.161*		*ug/L*	*0.14*		*112*	*70-130*			
LCS Dup (B6C0830-BSD1)				Prepared & Analyzed: 02/24/16						
Gasoline Range Organics (GRO)	**0.761**	20	ug/L	0.82		93.1	70-130	4.12	30	
Surrogate: 4-Bromofluorobenzene	*0.150*		*ug/L*	*0.14*		*105*	*70-130*			
Duplicate (B6C0830-DUP1)			**Source: 6B29001-08**	Prepared & Analyzed: 02/24/16						
Gasoline Range Organics (GRO)	**32.7**	20	ug/L		30.6			6.72	30	
Surrogate: 4-Bromofluorobenzene	*0.128*		*ug/L*	*0.14*		*89.2*	*70-130*			
*Batch B6C0831 - *** DEFAULT PREP ****										
Blank (B6C0831-BLK1)				Prepared & Analyzed: 02/25/16						
Gasoline Range Organics (GRO)	<20	20	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.129*		*ug/L*	*0.14*		*90.4*	*70-130*			
LCS (B6C0831-BS1)				Prepared & Analyzed: 02/25/16						
Gasoline Range Organics (GRO)	**0.713**	20	ug/L	0.82		87.2	70-130			
Surrogate: 4-Bromofluorobenzene	*0.121*		*ug/L*	*0.14*		*84.6*	*70-130*			
LCS Dup (B6C0831-BSD1)				Prepared & Analyzed: 02/25/16						
Gasoline Range Organics (GRO)	**0.719**	20	ug/L	0.82		87.9	70-130	0.840	30	
Surrogate: 4-Bromofluorobenzene	*0.119*		*ug/L*	*0.14*		*83.3*	*70-130*			
Duplicate (B6C0831-DUP1)			**Source: 6B29001-18**	Prepared & Analyzed: 02/25/16						
Gasoline Range Organics (GRO)	**<20**	20	ug/L		<20				30	
Surrogate: 4-Bromofluorobenzene	*0.130*		*ug/L*	*0.14*		*91.0*	*70-130*			
*Batch B6C0832 - *** DEFAULT PREP ****										
Blank (B6C0832-BLK1)				Prepared & Analyzed: 02/26/16						
Gasoline Range Organics (GRO)	<20	20	ug/L							

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Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by EPA TO-3 - Quality Control										
*Batch B6C0832 - *** DEFAULT PREP ****										
Blank (B6C0832-BLK1) Continued				Prepared & Analyzed: 02/26/16						
Surrogate: 4-Bromofluorobenzene	*0.119*		*ug/L*	*0.14*		*83.1*	*70-130*			
LCS (B6C0832-BS1)				Prepared & Analyzed: 02/26/16						
Gasoline Range Organics (GRO)	**0.742**	20	ug/L	0.82		90.7	70-130			
Surrogate: 4-Bromofluorobenzene	*0.168*		*ug/L*	*0.14*		*118*	*70-130*			
LCS Dup (B6C0832-BSD1)				Prepared & Analyzed: 02/26/16						
Gasoline Range Organics (GRO)	**0.734**	20	ug/L	0.82		89.8	70-130	1.09	30	
Surrogate: 4-Bromofluorobenzene	*0.159*		*ug/L*	*0.14*		*111*	*70-130*			
Duplicate (B6C0832-DUP1)			**Source: 6B29001-37**	Prepared & Analyzed: 02/26/16						
Gasoline Range Organics (GRO)	**4500**	2000	ug/L		4090			9.52	30	
Surrogate: 4-Bromofluorobenzene	*0.128*		*ug/L*	*0.14*		*89.6*	*70-130*			
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0827 - *** DEFAULT PREP ****										
Blank (B6C0827-BLK1)				Prepared & Analyzed: 02/24/16						
Acetone	<0.020	0.020	ug/L							
Allyl chloride	<0.020	0.020	ug/L							
tert-Amyl Methyl Ether (TAME)	<0.020	0.020	ug/L							
Benzene	<0.020	0.020	ug/L							
Benzyl chloride	<0.020	0.020	ug/L							
Bromodichloromethane	<0.020	0.020	ug/L							
Bromoform	<0.020	0.020	ug/L							
Bromomethane	<0.020	0.020	ug/L							
1,3-Butadiene	<0.020	0.020	ug/L							
2-Butanone (MEK)	<0.020	0.020	ug/L							
tert-Butyl alcohol (TBA)	<20	20	ug/L							
Carbon Disulfide	<0.020	0.020	ug/L							
Carbon Tetrachloride	<0.020	0.020	ug/L							
Chlorobenzene	<0.020	0.020	ug/L							
Chloroethane	<0.020	0.020	ug/L							
Chloroform	<0.020	0.020	ug/L							
Chloromethane	<0.020	0.020	ug/L							

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Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0827 - *** DEFAULT PREP ****										
Blank (B6C0827-BLK1) Continued				Prepared & Analyzed: 02/24/16						
Cyclohexane	<0.020	0.020	ug/L							
Dibromochloromethane	<0.020	0.020	ug/L							
1,2-Dibromoethane (EDB)	<0.020	0.020	ug/L							
1,2-Dichlorobenzene	<0.020	0.020	ug/L							
1,3-Dichlorobenzene	<0.020	0.020	ug/L							
1,4-Dichlorobenzene	<0.020	0.020	ug/L							
Dichlorodifluoromethane (R12)	<0.020	0.020	ug/L							
1,1-Dichloroethane	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							
cis-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,1-Dichloroethylene	<0.020	0.020	ug/L							
trans-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,2-Dichloropropane	<0.020	0.020	ug/L							
trans-1,3-Dichloropropylene	<0.020	0.020	ug/L							
cis-1,3-Dichloropropylene	<0.020	0.020	ug/L							
Dichlorotetrafluoroethane	<0.020	0.020	ug/L							
Diisopropyl ether (DIPE)	<0.020	0.020	ug/L							
1,4-Dioxane	<0.020	0.020	ug/L							
Ethanol	<0.020	0.020	ug/L							
Ethyl Acetate	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Ethyl-tert-Butyl Ether (ETBE)	<0.020	0.020	ug/L							
4-Ethyltoluene	<0.020	0.020	ug/L							
Heptane	<0.020	0.020	ug/L							
Hexachlorobutadiene	<0.020	0.020	ug/L							
n-Hexane	<0.020	0.020	ug/L							
2-Hexanone (MBK)	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.20	0.20	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<0.020	0.020	ug/L							
Methylene Chloride	<0.020	0.020	ug/L							
4-Methyl-2-pentanone (MIBK)	<0.020	0.020	ug/L							
Naphthalene	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0827 - *** DEFAULT PREP ****										
Blank (B6C0827-BLK1) Continued				Prepared & Analyzed: 02/24/16						
Propylene	<0.020	0.020	ug/L							
Styrene	<0.020	0.020	ug/L							
1,1,2,2-Tetrachloroethane	<0.020	0.020	ug/L							
Tetrachloroethylene (PCE)	<0.020	0.020	ug/L							
Tetrahydrofuran (THF)	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,2,4-Trichlorobenzene	<0.020	0.020	ug/L							
1,1,2-Trichloroethane	<0.020	0.020	ug/L							
1,1,1-Trichloroethane	<0.020	0.020	ug/L							
Trichloroethylene (TCE)	<0.020	0.020	ug/L							
Trichlorofluoromethane (R11)	<0.020	0.020	ug/L							
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	0.020	ug/L							
1,3,5-Trimethylbenzene	<0.020	0.020	ug/L							
1,2,4-Trimethylbenzene	<0.020	0.020	ug/L							
2,2,4-Trimethylpentane	<0.020	0.020	ug/L							
Vinyl acetate	<0.020	0.020	ug/L							
Vinyl bromide	<0.020	0.020	ug/L							
Vinyl chloride	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							
m,p-Xylenes	<0.020	0.020	ug/L							
1,2,3-Trichloropropane	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
4-Isopropyltoluene	<0.020	0.020	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.137*		*ug/L*	*0.14*		*95.6*	*70-130*			
LCS (B6C0827-BS1)				Prepared & Analyzed: 02/24/16						
Acetone	**0.0283**	0.020	ug/L	0.024		119	70-130		30	
Benzene	**0.0299**	0.020	ug/L	0.032		93.6	70-130		30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0827 - *** DEFAULT PREP ****										
LCS (B6C0827-BS1) Continued				Prepared & Analyzed: 02/24/16						
Benzyl chloride	**0.0606**	0.020	ug/L	0.052		117	70-130		30	
Bromodichloromethane	**0.0768**	0.020	ug/L	0.067		115	70-130		30	
Bromoform	**0.116**	0.020	ug/L	0.10		112	70-130		30	
Bromomethane	**0.0404**	0.020	ug/L	0.039		104	70-130		30	
2-Butanone (MEK)	**0.0273**	0.020	ug/L	0.029		92.5	70-130		30	
Carbon Disulfide	**0.0252**	0.020	ug/L	0.031		80.8	70-130		30	
Carbon Tetrachloride	**0.0730**	0.020	ug/L	0.063		116	70-130		30	
Chlorobenzene	**0.0482**	0.020	ug/L	0.046		105	70-130		30	
Chloroethane	**0.0240**	0.020	ug/L	0.026		91.0	70-130		30	
Chloroform	**0.0571**	0.020	ug/L	0.049		117	70-130		30	
Chloromethane	**0.0158**	0.020	ug/L	0.021		76.4	70-130		30	
Dibromochloromethane	**0.0952**	0.020	ug/L	0.085		112	70-130		30	
1,2-Dibromoethane (EDB)	**0.0778**	0.020	ug/L	0.077		101	70-130		30	
1,2-Dichlorobenzene	**0.0690**	0.020	ug/L	0.060		115	70-130		30	
1,3-Dichlorobenzene	**0.0708**	0.020	ug/L	0.060		118	70-130		30	
1,4-Dichlorobenzene	**0.0655**	0.020	ug/L	0.060		109	70-130		30	
Dichlorodifluoromethane (R12)	**0.0575**	0.020	ug/L	0.049		116	70-130		30	
1,1-Dichloroethane	**0.0419**	0.020	ug/L	0.040		104	70-130		30	
1,2-Dichloroethane (EDC)	**0.0491**	0.020	ug/L	0.040		121	70-130		30	
cis-1,2-Dichloroethylene	**0.0358**	0.020	ug/L	0.040		90.2	70-130		30	
1,1-Dichloroethylene	**0.0361**	0.020	ug/L	0.040		91.1	70-130		30	
trans-1,2-Dichloroethylene	**0.0341**	0.020	ug/L	0.040		86.1	70-130		30	
1,2-Dichloropropane	**0.0455**	0.020	ug/L	0.046		98.4	70-130		30	
trans-1,3-Dichloropropylene	**0.0449**	0.020	ug/L	0.045		99.0	70-130		30	
cis-1,3-Dichloropropylene	**0.0428**	0.020	ug/L	0.045		94.4	70-130		30	
Dichlorotetrafluoroethane	**0.0800**	0.020	ug/L	0.070		114	70-130		30	
Ethylbenzene	**0.0459**	0.020	ug/L	0.043		106	70-130		30	
4-Ethyltoluene	**0.0577**	0.020	ug/L	0.049		117	70-130		30	
Hexachlorobutadiene	**0.123**	0.020	ug/L	0.11		115	70-130		30	
2-Hexanone (MBK)	**0.0385**	0.020	ug/L	0.041		94.0	70-130		30	
Isopropanol (IPA)	**0.0226**	0.20	ug/L	0.025		91.8	70-130		30	
Methylene Chloride	**0.0297**	0.020	ug/L	0.035		85.6	70-130		30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0827 - *** DEFAULT PREP ****										
LCS (B6C0827-BS1) Continued				Prepared & Analyzed: 02/24/16						
4-Methyl-2-pentanone (MIBK)	**0.0389**	0.020	ug/L	0.041		95.0	70-130		30	
Styrene	**0.0440**	0.020	ug/L	0.043		103	70-130		30	
1,1,2,2-Tetrachloroethane	**0.0839**	0.020	ug/L	0.069		122	70-130		30	
Tetrachloroethylene (PCE)	**0.0638**	0.020	ug/L	0.068		94.0	70-130		30	
Toluene	**0.0364**	0.020	ug/L	0.038		96.7	70-130		30	
1,2,4-Trichlorobenzene	**0.0743**	0.020	ug/L	0.074		100	70-130		30	
1,1,2-Trichloroethane	**0.0615**	0.020	ug/L	0.055		113	70-130		30	
1,1,1-Trichloroethane	**0.0623**	0.020	ug/L	0.055		114	70-130		30	
Trichloroethylene (TCE)	**0.0576**	0.020	ug/L	0.054		107	70-130		30	
Trichlorofluoromethane (R11)	**0.0694**	0.020	ug/L	0.056		124	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0809**	0.020	ug/L	0.077		106	70-130		30	
1,3,5-Trimethylbenzene	**0.0593**	0.020	ug/L	0.049		121	70-130		30	
1,2,4-Trimethylbenzene	**0.0568**	0.020	ug/L	0.049		116	70-130		30	
Vinyl acetate	**0.0343**	0.020	ug/L	0.035		97.4	70-130		30	
Vinyl chloride	**0.0242**	0.020	ug/L	0.026		94.6	70-130		30	
o-Xylene	**0.0522**	0.020	ug/L	0.043		120	70-130		30	
m,p-Xylenes	**0.0951**	0.020	ug/L	0.087		109	70-130		30	
1,2,3-Trichloropropane	**0.0742**	0.020	ug/L	0.060		123	70-130		30	
sec-Butylbenzene	**0.0692**	0.020	ug/L	0.055		126	70-130		30	
Isopropylbenzene	**0.0586**	0.020	ug/L	0.049		119	70-130		30	
n-Propylbenzene	**0.0565**	0.020	ug/L	0.049		115	70-130		30	
4-Isopropyltoluene	**0.0668**	0.020	ug/L	0.055		122	70-130		30	
Surrogate: 4-Bromofluorobenzene	*0.161*		*ug/L*	*0.14*		*112*	*70-130*			
LCS Dup (B6C0827-BSD1)				Prepared & Analyzed: 02/24/16						
Acetone	**0.0229**	0.020	ug/L	0.024		96.2	70-130	21.4	30	
Benzene	**0.0303**	0.020	ug/L	0.032		94.9	70-130	1.38	30	
Benzyl chloride	**0.0577**	0.020	ug/L	0.052		111	70-130	4.90	30	
Bromodichloromethane	**0.0722**	0.020	ug/L	0.067		108	70-130	6.21	30	
Bromoform	**0.109**	0.020	ug/L	0.10		106	70-130	5.61	30	
Bromomethane	**0.0416**	0.020	ug/L	0.039		107	70-130	2.94	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0827 - *** DEFAULT PREP ****										
LCS Dup (B6C0827-BSD1) Continued				Prepared & Analyzed: 02/24/16						
2-Butanone (MEK)	**0.0258**	0.020	ug/L	0.029		87.5	70-130	5.56	30	
Carbon Disulfide	**0.0259**	0.020	ug/L	0.031		83.3	70-130	3.05	30	
Carbon Tetrachloride	**0.0682**	0.020	ug/L	0.063		108	70-130	6.77	30	
Chlorobenzene	**0.0481**	0.020	ug/L	0.046		104	70-130	0.191	30	
Chloroethane	**0.0292**	0.020	ug/L	0.026		110	70-130	19.4	30	
Chloroform	**0.0512**	0.020	ug/L	0.049		105	70-130	10.9	30	
Chloromethane	**0.0191**	0.020	ug/L	0.021		92.3	70-130	18.9	30	
Dibromochloromethane	**0.0895**	0.020	ug/L	0.085		105	70-130	6.09	30	
1,2-Dibromoethane (EDB)	**0.0762**	0.020	ug/L	0.077		99.2	70-130	2.00	30	
1,2-Dichlorobenzene	**0.0649**	0.020	ug/L	0.060		108	70-130	6.20	30	
1,3-Dichlorobenzene	**0.0639**	0.020	ug/L	0.060		106	70-130	10.4	30	
1,4-Dichlorobenzene	**0.0642**	0.020	ug/L	0.060		107	70-130	2.04	30	
Dichlorodifluoromethane (R12)	**0.0550**	0.020	ug/L	0.049		111	70-130	4.31	30	
1,1-Dichloroethane	**0.0393**	0.020	ug/L	0.040		97.0	70-130	6.58	30	
1,2-Dichloroethane (EDC)	**0.0419**	0.020	ug/L	0.040		103	70-130	16.0	30	
cis-1,2-Dichloroethylene	**0.0362**	0.020	ug/L	0.040		91.3	70-130	1.21	30	
1,1-Dichloroethylene	**0.0355**	0.020	ug/L	0.040		89.6	70-130	1.66	30	
trans-1,2-Dichloroethylene	**0.0359**	0.020	ug/L	0.040		90.5	70-130	4.98	30	
1,2-Dichloropropane	**0.0428**	0.020	ug/L	0.046		92.7	70-130	5.97	30	
trans-1,3-Dichloropropylene	**0.0446**	0.020	ug/L	0.045		98.3	70-130	0.710	30	
cis-1,3-Dichloropropylene	**0.0423**	0.020	ug/L	0.045		93.3	70-130	1.17	30	
Dichlorotetrafluoroethane	**0.0775**	0.020	ug/L	0.070		111	70-130	3.11	30	
Ethylbenzene	**0.0457**	0.020	ug/L	0.043		105	70-130	0.284	30	
4-Ethyltoluene	**0.0529**	0.020	ug/L	0.049		108	70-130	8.63	30	
Hexachlorobutadiene	**0.115**	0.020	ug/L	0.11		108	70-130	6.63	30	
2-Hexanone (MBK)	**0.0358**	0.020	ug/L	0.041		87.5	70-130	7.16	30	
Isopropanol (IPA)	**0.0251**	0.20	ug/L	0.025		102	70-130	10.7	30	
Methylene Chloride	**0.0303**	0.020	ug/L	0.035		87.1	70-130	1.74	30	
4-Methyl-2-pentanone (MIBK)	**0.0379**	0.020	ug/L	0.041		92.4	70-130	2.77	30	
Styrene	**0.0430**	0.020	ug/L	0.043		101	70-130	2.45	30	
1,1,2,2-Tetrachloroethane	**0.0792**	0.020	ug/L	0.069		115	70-130	5.81	30	
Tetrachloroethylene (PCE)	**0.0650**	0.020	ug/L	0.068		95.8	70-130	1.90	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0827 - *** DEFAULT PREP ****										
LCS Dup (B6C0827-BSD1) Continued				Prepared & Analyzed: 02/24/16						
Toluene	**0.0348**	0.020	ug/L	0.038		92.4	70-130	4.55	30	
1,2,4-Trichlorobenzene	**0.0722**	0.020	ug/L	0.074		97.3	70-130	2.84	30	
1,1,2-Trichloroethane	**0.0522**	0.020	ug/L	0.055		95.6	70-130	16.5	30	
1,1,1-Trichloroethane	**0.0579**	0.020	ug/L	0.055		106	70-130	7.27	30	
Trichloroethylene (TCE)	**0.0608**	0.020	ug/L	0.054		113	70-130	5.45	30	
Trichlorofluoromethane (R11)	**0.0643**	0.020	ug/L	0.056		114	70-130	7.65	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0786**	0.020	ug/L	0.077		102	70-130	2.98	30	
1,3,5-Trimethylbenzene	**0.0555**	0.020	ug/L	0.049		113	70-130	6.59	30	
1,2,4-Trimethylbenzene	**0.0539**	0.020	ug/L	0.049		110	70-130	5.33	30	
Vinyl acetate	**0.0289**	0.020	ug/L	0.035		82.0	70-130	17.2	30	
Vinyl chloride	**0.0260**	0.020	ug/L	0.026		102	70-130	7.43	30	
o-Xylene	**0.0484**	0.020	ug/L	0.043		111	70-130	7.68	30	
m,p-Xylenes	**0.0951**	0.020	ug/L	0.087		110	70-130	0.0913	30	
1,2,3-Trichloropropane	**0.0690**	0.020	ug/L	0.060		114	70-130	7.33	30	
sec-Butylbenzene	**0.0625**	0.020	ug/L	0.055		114	70-130	10.2	30	
Isopropylbenzene	**0.0541**	0.020	ug/L	0.049		110	70-130	7.94	30	
n-Propylbenzene	**0.0540**	0.020	ug/L	0.049		110	70-130	4.45	30	
4-Isopropyltoluene	**0.0612**	0.020	ug/L	0.055		111	70-130	8.76	30	
Surrogate: 4-Bromofluorobenzene	*0.150*		*ug/L*	*0.14*		*105*	*70-130*			
Duplicate (B6C0827-DUP1)			**Source: 6B29001-08**	Prepared & Analyzed: 02/24/16						
Acetone	**<0.080**	0.080	ug/L		<0.040				30	
Allyl chloride	**<0.080**	0.080	ug/L		<0.040				30	
tert-Amyl Methyl Ether (TAME)	**<0.080**	0.080	ug/L		<0.040				30	
Benzene	**<0.080**	0.080	ug/L		<0.040				30	
Benzyl chloride	**<0.080**	0.080	ug/L		<0.040				30	
Bromodichloromethane	**<0.080**	0.080	ug/L		<0.040				30	
Bromoform	**<0.080**	0.080	ug/L		<0.040				30	
Bromomethane	**<0.080**	0.080	ug/L		<0.040				30	
1,3-Butadiene	**<0.080**	0.080	ug/L		<0.040				30	
2-Butanone (MEK)	**<0.080**	0.080	ug/L		<0.040				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0827 - *** DEFAULT PREP ****										
Duplicate (B6C0827-DUP1) Continued	**Source: 6B29001-08**	Prepared & Analyzed: 02/24/16								
tert-Butyl alcohol (TBA)	**<80**	80	ug/L		<40				30	
Carbon Disulfide	**<0.080**	0.080	ug/L		<0.040				30	
Carbon Tetrachloride	**<0.080**	0.080	ug/L		<0.040				30	
Chlorobenzene	**<0.080**	0.080	ug/L		<0.040				30	
Chloroethane	**<0.080**	0.080	ug/L		<0.040				30	
Chloroform	**<0.080**	0.080	ug/L		<0.040				30	
Chloromethane	**<0.080**	0.080	ug/L		<0.040				30	
Cyclohexane	**0.420**	0.080	ug/L		0.459			8.94	30	
Dibromochloromethane	**<0.080**	0.080	ug/L		<0.040				30	
1,2-Dibromoethane (EDB)	**<0.080**	0.080	ug/L		<0.040				30	
1,2-Dichlorobenzene	**<0.080**	0.080	ug/L		<0.040				30	
1,3-Dichlorobenzene	**<0.080**	0.080	ug/L		<0.040				30	
1,4-Dichlorobenzene	**<0.080**	0.080	ug/L		<0.040				30	
Dichlorodifluoromethane (R12)	**<0.080**	0.080	ug/L		<0.040				30	
1,1-Dichloroethane	**<0.080**	0.080	ug/L		<0.040				30	
1,2-Dichloroethane (EDC)	**<0.080**	0.080	ug/L		<0.040				30	
cis-1,2-Dichloroethylene	**<0.080**	0.080	ug/L		<0.040				30	
1,1-Dichloroethylene	**<0.080**	0.080	ug/L		<0.040				30	
trans-1,2-Dichloroethylene	**<0.080**	0.080	ug/L		<0.040				30	
1,2-Dichloropropane	**<0.080**	0.080	ug/L		<0.040				30	
trans-1,3-Dichloropropylene	**<0.080**	0.080	ug/L		<0.040				30	
cis-1,3-Dichloropropylene	**<0.080**	0.080	ug/L		<0.040				30	
Dichlorotetrafluoroethane	**<0.080**	0.080	ug/L		<0.040				30	
Diisopropyl ether (DIPE)	**<0.080**	0.080	ug/L		<0.040				30	
1,4-Dioxane	**<0.080**	0.080	ug/L		<0.040				30	
Ethanol	**<0.080**	0.080	ug/L		<0.040				30	
Ethyl Acetate	**<0.080**	0.080	ug/L		<0.040				30	
Ethylbenzene	**<0.080**	0.080	ug/L		<0.040				30	
Ethyl-tert-Butyl Ether (ETBE)	**<0.080**	0.080	ug/L		<0.040				30	
4-Ethyltoluene	**<0.080**	0.080	ug/L		<0.040				30	
Heptane	**<0.080**	0.080	ug/L		<0.040				30	
Hexachlorobutadiene	**<0.080**	0.080	ug/L		<0.040				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0827 - *** DEFAULT PREP ****										
Duplicate (B6C0827-DUP1) Continued **Source: 6B29001-08** Prepared & Analyzed: 02/24/16										
n-Hexane	**0.406**	0.080	ug/L		0.432			6.06	30	
2-Hexanone (MBK)	**<0.080**	0.080	ug/L		<0.040				30	
Isopropanol (IPA)	**<0.80**	0.80	ug/L		<0.40				30	
Methyl-tert-Butyl Ether (MTBE)	**<0.080**	0.080	ug/L		<0.040				30	
Methylene Chloride	**<0.080**	0.080	ug/L		<0.040				30	
4-Methyl-2-pentanone (MIBK)	**<0.080**	0.080	ug/L		<0.040				30	
Naphthalene	**<0.080**	0.080	ug/L		<0.040				30	
Propylene	**<0.080**	0.080	ug/L		<0.040				30	
Styrene	**<0.080**	0.080	ug/L		<0.040				30	
1,1,2,2-Tetrachloroethane	**<0.080**	0.080	ug/L		<0.040				30	
Tetrachloroethylene (PCE)	**<0.080**	0.080	ug/L		<0.040				30	
Tetrahydrofuran (THF)	**<0.080**	0.080	ug/L		<0.040				30	
Toluene	**<0.080**	0.080	ug/L		<0.040				30	
1,2,4-Trichlorobenzene	**<0.080**	0.080	ug/L		<0.040				30	
1,1,2-Trichloroethane	**<0.080**	0.080	ug/L		<0.040				30	
1,1,1-Trichloroethane	**<0.080**	0.080	ug/L		<0.040				30	
Trichloroethylene (TCE)	**<0.080**	0.080	ug/L		<0.040				30	
Trichlorofluoromethane (R11)	**<0.080**	0.080	ug/L		<0.040				30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**<0.080**	0.080	ug/L		<0.040				30	
1,3,5-Trimethylbenzene	**<0.080**	0.080	ug/L		<0.040				30	
1,2,4-Trimethylbenzene	**<0.080**	0.080	ug/L		<0.040				30	
2,2,4-Trimethylpentane	**6.10**	0.20	ug/L		5.56			9.21	30	
Vinyl acetate	**<0.080**	0.080	ug/L		<0.040				30	
Vinyl bromide	**<0.080**	0.080	ug/L		<0.040				30	
Vinyl chloride	**<0.080**	0.080	ug/L		<0.040				30	
o-Xylene	**<0.080**	0.080	ug/L		<0.040				30	
m,p-Xylenes	**<0.080**	0.080	ug/L		0.0239				30	
1,2,3-Trichloropropane	**<0.080**	0.080	ug/L		<0.040				30	
sec-Butylbenzene	**<0.080**	0.080	ug/L		<0.040				30	
Isopropylbenzene	**<0.080**	0.080	ug/L		<0.040				30	
n-Propylbenzene	**<0.080**	0.080	ug/L		<0.040				30	

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LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0827 - *** DEFAULT PREP ****										
Duplicate (B6C0827-DUP1) Continued			**Source: 6B29001-08**	Prepared & Analyzed: 02/24/16						
4-Isopropyltoluene	**<0.080**	0.080	ug/L		<0.040				30	
n-Butylbenzene	**<0.080**	0.080	ug/L		<0.040				30	
Surrogate: 4-Bromofluorobenzene	*0.137*		*ug/L*	*0.14*		*95.5*	*70-130*			
*Batch B6C0828 - *** DEFAULT PREP ****										
Blank (B6C0828-BLK1)				Prepared & Analyzed: 02/25/16						
Acetone	<0.020	0.020	ug/L							
Allyl chloride	<0.020	0.020	ug/L							
tert-Amyl Methyl Ether (TAME)	<0.020	0.020	ug/L							
Benzene	<0.020	0.020	ug/L							
Benzyl chloride	<0.020	0.020	ug/L							
Bromodichloromethane	<0.020	0.020	ug/L							
Bromoform	<0.020	0.020	ug/L							
Bromomethane	<0.020	0.020	ug/L							
1,3-Butadiene	<0.020	0.020	ug/L							
2-Butanone (MEK)	<0.020	0.020	ug/L							
tert-Butyl alcohol (TBA)	<20	20	ug/L							
Carbon Disulfide	<0.020	0.020	ug/L							
Carbon Tetrachloride	<0.020	0.020	ug/L							
Chlorobenzene	<0.020	0.020	ug/L							
Chloroethane	<0.020	0.020	ug/L							
Chloroform	<0.020	0.020	ug/L							
Chloromethane	<0.020	0.020	ug/L							
Cyclohexane	<0.020	0.020	ug/L							
Dibromochloromethane	<0.020	0.020	ug/L							
1,2-Dibromoethane (EDB)	<0.020	0.020	ug/L							
1,2-Dichlorobenzene	<0.020	0.020	ug/L							
1,3-Dichlorobenzene	<0.020	0.020	ug/L							
1,4-Dichlorobenzene	<0.020	0.020	ug/L							
Dichlorodifluoromethane (R12)	<0.020	0.020	ug/L							
1,1-Dichloroethane	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0828 - *** DEFAULT PREP ****										
Blank (B6C0828-BLK1) Continued				Prepared & Analyzed: 02/25/16						
cis-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,1-Dichloroethylene	<0.020	0.020	ug/L							
trans-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,2-Dichloropropane	<0.020	0.020	ug/L							
trans-1,3-Dichloropropylene	<0.020	0.020	ug/L							
cis-1,3-Dichloropropylene	<0.020	0.020	ug/L							
Dichlorotetrafluoroethane	<0.020	0.020	ug/L							
Diisopropyl ether (DIPE)	<0.020	0.020	ug/L							
1,4-Dioxane	<0.020	0.020	ug/L							
Ethanol	<0.020	0.020	ug/L							
Ethyl Acetate	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Ethyl-tert-Butyl Ether (ETBE)	<0.020	0.020	ug/L							
4-Ethyltoluene	<0.020	0.020	ug/L							
Heptane	<0.020	0.020	ug/L							
Hexachlorobutadiene	<0.020	0.020	ug/L							
n-Hexane	<0.020	0.020	ug/L							
2-Hexanone (MBK)	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.20	0.20	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<0.020	0.020	ug/L							
Methylene Chloride	<0.020	0.020	ug/L							
4-Methyl-2-pentanone (MIBK)	<0.020	0.020	ug/L							
Naphthalene	<0.020	0.020	ug/L							
Propylene	<0.020	0.020	ug/L							
Styrene	<0.020	0.020	ug/L							
1,1,2,2-Tetrachloroethane	<0.020	0.020	ug/L							
Tetrachloroethylene (PCE)	<0.020	0.020	ug/L							
Tetrahydrofuran (THF)	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,2,4-Trichlorobenzene	<0.020	0.020	ug/L							
1,1,2-Trichloroethane	<0.020	0.020	ug/L							
1,1,1-Trichloroethane	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0828 - *** DEFAULT PREP ****										
Blank (B6C0828-BLK1) Continued				Prepared & Analyzed: 02/25/16						
Trichloroethylene (TCE)	<0.020	0.020	ug/L							
Trichlorofluoromethane (R11)	<0.020	0.020	ug/L							
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	0.020	ug/L							
1,3,5-Trimethylbenzene	<0.020	0.020	ug/L							
1,2,4-Trimethylbenzene	<0.020	0.020	ug/L							
2,2,4-Trimethylpentane	<0.020	0.020	ug/L							
Vinyl acetate	<0.020	0.020	ug/L							
Vinyl bromide	<0.020	0.020	ug/L							
Vinyl chloride	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							
m,p-Xylenes	<0.020	0.020	ug/L							
1,2,3-Trichloropropane	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
4-Isopropyltoluene	<0.020	0.020	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.129*		*ug/L*	*0.14*		*90.4*	*70-130*			
LCS (B6C0828-BS1)				Prepared & Analyzed: 02/25/16						
Acetone	**0.0160**	0.020	ug/L	0.024		67.5	70-130		30	***, **a
Benzene	**0.0356**	0.020	ug/L	0.032		112	70-130		30	
Benzyl chloride	**0.0473**	0.020	ug/L	0.052		91.4	70-130		30	
Bromodichloromethane	**0.0611**	0.020	ug/L	0.067		91.2	70-130		30	
Bromoform	**0.104**	0.020	ug/L	0.10		100	70-130		30	
Bromomethane	**0.0284**	0.020	ug/L	0.039		73.1	70-130		30	
2-Butanone (MEK)	**0.0262**	0.020	ug/L	0.029		88.8	70-130		30	
Carbon Disulfide	**0.0212**	0.020	ug/L	0.031		68.2	70-130		30	***, **
Carbon Tetrachloride	**0.0547**	0.020	ug/L	0.063		87.0	70-130		30	
Chlorobenzene	**0.0475**	0.020	ug/L	0.046		103	70-130		30	
Chloroethane	**0.0185**	0.020	ug/L	0.026		70.0	70-130		30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0828 - *** DEFAULT PREP ****										
LCS (B6C0828-BS1) Continued				Prepared & Analyzed: 02/25/16						
Chloroform	**0.0447**	0.020	ug/L	0.049		91.6	70-130		30	
Chloromethane	**0.0136**	0.020	ug/L	0.021		65.8	70-130		30	***, **
Dibromochloromethane	**0.0826**	0.020	ug/L	0.085		97.0	70-130		30	
1,2-Dibromoethane (EDB)	**0.0823**	0.020	ug/L	0.077		107	70-130		30	
1,2-Dichlorobenzene	**0.0598**	0.020	ug/L	0.060		99.5	70-130		30	
1,3-Dichlorobenzene	**0.0601**	0.020	ug/L	0.060		99.9	70-130		30	
1,4-Dichlorobenzene	**0.0595**	0.020	ug/L	0.060		98.9	70-130		30	
Dichlorodifluoromethane (R12)	**0.0390**	0.020	ug/L	0.049		78.8	70-130		30	
1,1-Dichloroethane	**0.0378**	0.020	ug/L	0.040		93.5	70-130		30	
1,2-Dichloroethane (EDC)	**0.0358**	0.020	ug/L	0.040		88.5	70-130		30	
cis-1,2-Dichloroethylene	**0.0403**	0.020	ug/L	0.040		102	70-130		30	
1,1-Dichloroethylene	**0.0282**	0.020	ug/L	0.040		71.0	70-130		30	
trans-1,2-Dichloroethylene	**0.0356**	0.020	ug/L	0.040		89.7	70-130		30	
1,2-Dichloropropane	**0.0470**	0.020	ug/L	0.046		102	70-130		30	
trans-1,3-Dichloropropylene	**0.0469**	0.020	ug/L	0.045		103	70-130		30	
cis-1,3-Dichloropropylene	**0.0448**	0.020	ug/L	0.045		98.8	70-130		30	
Dichlorotetrafluoroethane	**0.0535**	0.020	ug/L	0.070		76.5	70-130		30	
Ethylbenzene	**0.0449**	0.020	ug/L	0.043		103	70-130		30	
4-Ethyltoluene	**0.0477**	0.020	ug/L	0.049		97.0	70-130		30	
Hexachlorobutadiene	**0.0973**	0.020	ug/L	0.11		91.2	70-130		30	
2-Hexanone (MBK)	**0.0398**	0.020	ug/L	0.041		97.2	70-130		30	
Isopropanol (IPA)	**0.0175**	0.20	ug/L	0.025		71.3	70-130		30	
Methylene Chloride	**0.0237**	0.020	ug/L	0.035		68.1	70-130		30	***, **
4-Methyl-2-pentanone (MIBK)	**0.0381**	0.020	ug/L	0.041		93.1	70-130		30	
Styrene	**0.0446**	0.020	ug/L	0.043		105	70-130		30	
1,1,2,2-Tetrachloroethane	**0.0650**	0.020	ug/L	0.069		94.7	70-130		30	
Tetrachloroethylene (PCE)	**0.0849**	0.020	ug/L	0.068		125	70-130		30	
Toluene	**0.0425**	0.020	ug/L	0.038		113	70-130		30	
1,2,4-Trichlorobenzene	**0.0696**	0.020	ug/L	0.074		93.8	70-130		30	
1,1,2-Trichloroethane	**0.0588**	0.020	ug/L	0.055		108	70-130		30	
1,1,1-Trichloroethane	**0.0512**	0.020	ug/L	0.055		93.9	70-130		30	
Trichloroethylene (TCE)	**0.0527**	0.020	ug/L	0.054		98.0	70-130		30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0828 - *** DEFAULT PREP ****										
LCS (B6C0828-BS1) Continued				Prepared & Analyzed: 02/25/16						
Trichlorofluoromethane (R11)	**0.0421**	0.020	ug/L	0.056		75.0	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0591**	0.020	ug/L	0.077		77.1	70-130		30	
1,3,5-Trimethylbenzene	**0.0483**	0.020	ug/L	0.049		98.3	70-130		30	
1,2,4-Trimethylbenzene	**0.0470**	0.020	ug/L	0.049		95.6	70-130		30	
Vinyl acetate	**0.0347**	0.020	ug/L	0.035		98.6	70-130		30	
Vinyl chloride	**0.0189**	0.020	ug/L	0.026		73.9	70-130		30	
o-Xylene	**0.0419**	0.020	ug/L	0.043		96.4	70-130		30	
m,p-Xylenes	**0.0914**	0.020	ug/L	0.087		105	70-130		30	
1,2,3-Trichloropropane	**0.0508**	0.020	ug/L	0.060		84.3	70-130		30	
sec-Butylbenzene	**0.0536**	0.020	ug/L	0.055		97.6	70-130		30	
Isopropylbenzene	**0.0499**	0.020	ug/L	0.049		102	70-130		30	
n-Propylbenzene	**0.0488**	0.020	ug/L	0.049		99.2	70-130		30	
4-Isopropyltoluene	**0.0532**	0.020	ug/L	0.055		97.0	70-130		30	
Surrogate: 4-Bromofluorobenzene	*0.121*		*ug/L*	*0.14*		*84.6*	*70-130*			
LCS Dup (B6C0828-BSD1)				Prepared & Analyzed: 02/25/16						
Acetone	**0.0198**	0.020	ug/L	0.024		83.5	70-130	21.2	30	
Benzene	**0.0354**	0.020	ug/L	0.032		111	70-130	0.720	30	
Benzyl chloride	**0.0468**	0.020	ug/L	0.052		90.4	70-130	1.10	30	
Bromodichloromethane	**0.0589**	0.020	ug/L	0.067		87.9	70-130	3.69	30	
Bromoform	**0.0995**	0.020	ug/L	0.10		96.3	70-130	3.97	30	
Bromomethane	**0.0289**	0.020	ug/L	0.039		74.3	70-130	1.63	30	
2-Butanone (MEK)	**0.0252**	0.020	ug/L	0.029		85.4	70-130	3.90	30	
Carbon Disulfide	**0.0213**	0.020	ug/L	0.031		68.4	70-130	0.293	30	***, **
Carbon Tetrachloride	**0.0530**	0.020	ug/L	0.063		84.3	70-130	3.15	30	
Chlorobenzene	**0.0470**	0.020	ug/L	0.046		102	70-130	1.07	30	
Chloroethane	**0.0184**	0.020	ug/L	0.026		69.6	70-130	0.573	30	***, **
Chloroform	**0.0439**	0.020	ug/L	0.049		90.0	70-130	1.76	30	
Chloromethane	**0.0147**	0.020	ug/L	0.021		71.3	70-130	8.02	30	
Dibromochloromethane	**0.0831**	0.020	ug/L	0.085		97.6	70-130	0.617	30	
1,2-Dibromoethane (EDB)	**0.0791**	0.020	ug/L	0.077		103	70-130	4.00	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0828 - *** DEFAULT PREP ****										
LCS Dup (B6C0828-BSD1) Continued				Prepared & Analyzed: 02/25/16						
1,2-Dichlorobenzene	**0.0572**	0.020	ug/L	0.060		95.1	70-130	4.52	30	
1,3-Dichlorobenzene	**0.0594**	0.020	ug/L	0.060		98.8	70-130	1.11	30	
1,4-Dichlorobenzene	**0.0575**	0.020	ug/L	0.060		95.6	70-130	3.39	30	
Dichlorodifluoromethane (R12)	**0.0404**	0.020	ug/L	0.049		81.6	70-130	3.49	30	
1,1-Dichloroethane	**0.0331**	0.020	ug/L	0.040		81.8	70-130	13.3	30	
1,2-Dichloroethane (EDC)	**0.0351**	0.020	ug/L	0.040		86.8	70-130	1.94	30	
cis-1,2-Dichloroethylene	**0.0409**	0.020	ug/L	0.040		103	70-130	1.37	30	
1,1-Dichloroethylene	**0.0278**	0.020	ug/L	0.040		70.1	70-130	1.28	30	
trans-1,2-Dichloroethylene	**0.0337**	0.020	ug/L	0.040		84.9	70-130	5.50	30	
1,2-Dichloropropane	**0.0444**	0.020	ug/L	0.046		96.0	70-130	5.67	30	
trans-1,3-Dichloropropylene	**0.0432**	0.020	ug/L	0.045		95.1	70-130	8.27	30	
cis-1,3-Dichloropropylene	**0.0440**	0.020	ug/L	0.045		96.9	70-130	1.94	30	
Dichlorotetrafluoroethane	**0.0566**	0.020	ug/L	0.070		80.9	70-130	5.59	30	
Ethylbenzene	**0.0425**	0.020	ug/L	0.043		97.8	70-130	5.57	30	
4-Ethyltoluene	**0.0469**	0.020	ug/L	0.049		95.5	70-130	1.56	30	
Hexachlorobutadiene	**0.0955**	0.020	ug/L	0.11		89.5	70-130	1.88	30	
2-Hexanone (MBK)	**0.0369**	0.020	ug/L	0.041		90.1	70-130	7.58	30	
Isopropanol (IPA)	**0.0178**	0.20	ug/L	0.025		72.5	70-130	1.67	30	
Methylene Chloride	**0.0243**	0.020	ug/L	0.035		70.0	70-130	2.75	30	
4-Methyl-2-pentanone (MIBK)	**0.0365**	0.020	ug/L	0.041		89.0	70-130	4.50	30	
Styrene	**0.0431**	0.020	ug/L	0.043		101	70-130	3.50	30	
1,1,2,2-Tetrachloroethane	**0.0618**	0.020	ug/L	0.069		90.0	70-130	5.09	30	
Tetrachloroethylene (PCE)	**0.0833**	0.020	ug/L	0.068		123	70-130	1.86	30	
Toluene	**0.0398**	0.020	ug/L	0.038		106	70-130	6.59	30	
1,2,4-Trichlorobenzene	**0.0706**	0.020	ug/L	0.074		95.1	70-130	1.38	30	
1,1,2-Trichloroethane	**0.0540**	0.020	ug/L	0.055		99.0	70-130	8.51	30	
1,1,1-Trichloroethane	**0.0503**	0.020	ug/L	0.055		92.2	70-130	1.83	30	
Trichloroethylene (TCE)	**0.0508**	0.020	ug/L	0.054		94.6	70-130	3.53	30	
Trichlorofluoromethane (R11)	**0.0425**	0.020	ug/L	0.056		75.6	70-130	0.797	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0630**	0.020	ug/L	0.077		82.2	70-130	6.40	30	
1,3,5-Trimethylbenzene	**0.0459**	0.020	ug/L	0.049		93.3	70-130	5.22	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0828 - *** DEFAULT PREP ****										
LCS Dup (B6C0828-BSD1) Continued				Prepared & Analyzed: 02/25/16						
1,2,4-Trimethylbenzene	**0.0449**	0.020	ug/L	0.049		91.4	70-130	4.49	30	
Vinyl acetate	**0.0358**	0.020	ug/L	0.035		102	70-130	3.19	30	
Vinyl chloride	**0.0188**	0.020	ug/L	0.026		73.5	70-130	0.543	30	
o-Xylene	**0.0399**	0.020	ug/L	0.043		91.9	70-130	4.78	30	
m,p-Xylenes	**0.0898**	0.020	ug/L	0.087		103	70-130	1.72	30	
1,2,3-Trichloropropane	**0.0497**	0.020	ug/L	0.060		82.5	70-130	2.16	30	
sec-Butylbenzene	**0.0518**	0.020	ug/L	0.055		94.4	70-130	3.33	30	
Isopropylbenzene	**0.0471**	0.020	ug/L	0.049		95.9	70-130	5.77	30	
n-Propylbenzene	**0.0475**	0.020	ug/L	0.049		96.7	70-130	2.55	30	
4-Isopropyltoluene	**0.0527**	0.020	ug/L	0.055		96.0	70-130	1.04	30	
Surrogate: 4-Bromofluorobenzene	*0.119*		*ug/L*	*0.14*		*83.3*	*70-130*			
Duplicate (B6C0828-DUP1)		**Source: 6B29001-18**		Prepared & Analyzed: 02/25/16						
Acetone	**<0.020**	0.020	ug/L		<0.020				30	
Allyl chloride	**<0.020**	0.020	ug/L		<0.020				30	
tert-Amyl Methyl Ether (TAME)	**<0.020**	0.020	ug/L		<0.020				30	
Benzene	**<0.020**	0.020	ug/L		<0.020				30	
Benzyl chloride	**<0.020**	0.020	ug/L		<0.020				30	
Bromodichloromethane	**<0.020**	0.020	ug/L		<0.020				30	
Bromoform	**<0.020**	0.020	ug/L		<0.020				30	
Bromomethane	**<0.020**	0.020	ug/L		<0.020				30	
1,3-Butadiene	**<0.020**	0.020	ug/L		<0.020				30	
2-Butanone (MEK)	**<0.020**	0.020	ug/L		<0.020				30	
tert-Butyl alcohol (TBA)	**<20**	20	ug/L		<20				30	
Carbon Disulfide	**<0.020**	0.020	ug/L		<0.020				30	
Carbon Tetrachloride	**<0.020**	0.020	ug/L		<0.020				30	
Chlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
Chloroethane	**<0.020**	0.020	ug/L		<0.020				30	
Chloroform	**<0.020**	0.020	ug/L		<0.020				30	
Chloromethane	**<0.020**	0.020	ug/L		<0.020				30	
Cyclohexane	**<0.020**	0.020	ug/L		<0.020				30	
Dibromochloromethane	**<0.020**	0.020	ug/L		<0.020				30	

Allen Aminian
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LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0828 - *** DEFAULT PREP ****										
Duplicate (B6C0828-DUP1) Continued	**Source: 6B29001-18**	Prepared & Analyzed: 02/25/16								
1,2-Dibromoethane (EDB)	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,3-Dichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,4-Dichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
Dichlorodifluoromethane (R12)	**<0.020**	0.020	ug/L		<0.020				30	
1,1-Dichloroethane	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dichloroethane (EDC)	**<0.020**	0.020	ug/L		<0.020				30	
cis-1,2-Dichloroethylene	**<0.020**	0.020	ug/L		<0.020				30	
1,1-Dichloroethylene	**<0.020**	0.020	ug/L		<0.020				30	
trans-1,2-Dichloroethylene	**<0.020**	0.020	ug/L		<0.020				30	
1,2-Dichloropropane	**<0.020**	0.020	ug/L		<0.020				30	
trans-1,3-Dichloropropylene	**<0.020**	0.020	ug/L		<0.020				30	
cis-1,3-Dichloropropylene	**<0.020**	0.020	ug/L		<0.020				30	
Dichlorotetrafluoroethane	**<0.020**	0.020	ug/L		<0.020				30	
Diisopropyl ether (DIPE)	**<0.020**	0.020	ug/L		<0.020				30	
1,4-Dioxane	**<0.020**	0.020	ug/L		<0.020				30	
Ethanol	**<0.020**	0.020	ug/L		<0.020				30	
Ethyl Acetate	**<0.020**	0.020	ug/L		<0.020				30	
Ethylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
Ethyl-tert-Butyl Ether (ETBE)	**<0.020**	0.020	ug/L		<0.020				30	
4-Ethyltoluene	**<0.020**	0.020	ug/L		<0.020				30	
Heptane	**<0.020**	0.020	ug/L		<0.020				30	
Hexachlorobutadiene	**<0.020**	0.020	ug/L		<0.020				30	
n-Hexane	**<0.020**	0.020	ug/L		0.0159			14.5	30	
2-Hexanone (MBK)	**<0.020**	0.020	ug/L		<0.020				30	
Isopropanol (IPA)	**<0.20**	0.20	ug/L		<0.20				30	
Methyl-tert-Butyl Ether (MTBE)	**<0.020**	0.020	ug/L		<0.020				30	
Methylene Chloride	**<0.020**	0.020	ug/L		<0.020				30	
4-Methyl-2-pentanone (MIBK)	**<0.020**	0.020	ug/L		<0.020				30	
Naphthalene	**<0.020**	0.020	ug/L		<0.020				30	
Propylene	**<0.020**	0.020	ug/L		<0.020				30	
Styrene	**<0.020**	0.020	ug/L		<0.020				30	

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LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0828 - *** DEFAULT PREP ****										
Duplicate (B6C0828-DUP1) Continued	**Source: 6B29001-18**		Prepared & Analyzed: 02/25/16							
1,1,2,2-Tetrachloroethane	**<0.020**	0.020	ug/L		<0.020				30	
Tetrachloroethylene (PCE)	**<0.020**	0.020	ug/L		<0.020				30	
Tetrahydrofuran (THF)	**<0.020**	0.020	ug/L		<0.020				30	
Toluene	**<0.020**	0.020	ug/L		<0.020				30	
1,2,4-Trichlorobenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,1,2-Trichloroethane	**<0.020**	0.020	ug/L		<0.020				30	
1,1,1-Trichloroethane	**<0.020**	0.020	ug/L		<0.020				30	
Trichloroethylene (TCE)	**<0.020**	0.020	ug/L		<0.020				30	
Trichlorofluoromethane (R11)	**<0.020**	0.020	ug/L		<0.020				30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**<0.020**	0.020	ug/L		<0.020				30	
1,3,5-Trimethylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
1,2,4-Trimethylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
2,2,4-Trimethylpentane	**<0.020**	0.020	ug/L		<0.020				30	
Vinyl acetate	**<0.020**	0.020	ug/L		<0.020				30	
Vinyl bromide	**<0.020**	0.020	ug/L		<0.020				30	
Vinyl chloride	**<0.020**	0.020	ug/L		<0.020				30	
o-Xylene	**<0.020**	0.020	ug/L		<0.020				30	
m,p-Xylenes	**<0.020**	0.020	ug/L		<0.020				30	
1,2,3-Trichloropropane	**<0.020**	0.020	ug/L		<0.020				30	
sec-Butylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
Isopropylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
n-Propylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
4-Isopropyltoluene	**<0.020**	0.020	ug/L		<0.020				30	
n-Butylbenzene	**<0.020**	0.020	ug/L		<0.020				30	
Surrogate: 4-Bromofluorobenzene	*0.130*		*ug/L*	*0.14*		*91.0*	*70-130*			
*Batch B6C0829 - *** DEFAULT PREP ****										
Blank (B6C0829-BLK1)			Prepared & Analyzed: 02/26/16							
Acetone	<0.020	0.020	ug/L							
Allyl chloride	<0.020	0.020	ug/L							
tert-Amyl Methyl Ether (TAME)	<0.020	0.020	ug/L							

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LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0829 - *** DEFAULT PREP ****										
Blank (B6C0829-BLK1) Continued				Prepared & Analyzed: 02/26/16						
Benzene	<0.020	0.020	ug/L							
Benzyl chloride	<0.020	0.020	ug/L							
Bromodichloromethane	<0.020	0.020	ug/L							
Bromoform	<0.020	0.020	ug/L							
Bromomethane	<0.020	0.020	ug/L							
1,3-Butadiene	<0.020	0.020	ug/L							
2-Butanone (MEK)	<0.020	0.020	ug/L							
tert-Butyl alcohol (TBA)	<20	20	ug/L							
Carbon Disulfide	<0.020	0.020	ug/L							
Carbon Tetrachloride	<0.020	0.020	ug/L							
Chlorobenzene	<0.020	0.020	ug/L							
Chloroethane	<0.020	0.020	ug/L							
Chloroform	<0.020	0.020	ug/L							
Chloromethane	<0.020	0.020	ug/L							
Cyclohexane	<0.020	0.020	ug/L							
Dibromochloromethane	<0.020	0.020	ug/L							
1,2-Dibromoethane (EDB)	<0.020	0.020	ug/L							
1,2-Dichlorobenzene	<0.020	0.020	ug/L							
1,3-Dichlorobenzene	<0.020	0.020	ug/L							
1,4-Dichlorobenzene	<0.020	0.020	ug/L							
Dichlorodifluoromethane (R12)	<0.020	0.020	ug/L							
1,1-Dichloroethane	<0.020	0.020	ug/L							
1,2-Dichloroethane (EDC)	<0.020	0.020	ug/L							
cis-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,1-Dichloroethylene	<0.020	0.020	ug/L							
trans-1,2-Dichloroethylene	<0.020	0.020	ug/L							
1,2-Dichloropropane	<0.020	0.020	ug/L							
trans-1,3-Dichloropropylene	<0.020	0.020	ug/L							
cis-1,3-Dichloropropylene	<0.020	0.020	ug/L							
Dichlorotetrafluoroethane	<0.020	0.020	ug/L							
Diisopropyl ether (DIPE)	<0.020	0.020	ug/L							
1,4-Dioxane	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0829 - *** DEFAULT PREP ****										
Blank (B6C0829-BLK1) Continued				Prepared & Analyzed: 02/26/16						
Ethanol	<0.020	0.020	ug/L							
Ethyl Acetate	<0.020	0.020	ug/L							
Ethylbenzene	<0.020	0.020	ug/L							
Ethyl-tert-Butyl Ether (ETBE)	<0.020	0.020	ug/L							
4-Ethyltoluene	<0.020	0.020	ug/L							
Heptane	<0.020	0.020	ug/L							
Hexachlorobutadiene	<0.020	0.020	ug/L							
n-Hexane	<0.020	0.020	ug/L							
2-Hexanone (MBK)	<0.020	0.020	ug/L							
Isopropanol (IPA)	<0.20	0.20	ug/L							
Methyl-tert-Butyl Ether (MTBE)	<0.020	0.020	ug/L							
Methylene Chloride	<0.020	0.020	ug/L							
4-Methyl-2-pentanone (MIBK)	<0.020	0.020	ug/L							
Naphthalene	<0.020	0.020	ug/L							
Propylene	<0.020	0.020	ug/L							
Styrene	<0.020	0.020	ug/L							
1,1,2,2-Tetrachloroethane	<0.020	0.020	ug/L							
Tetrachloroethylene (PCE)	<0.020	0.020	ug/L							
Tetrahydrofuran (THF)	<0.020	0.020	ug/L							
Toluene	<0.020	0.020	ug/L							
1,2,4-Trichlorobenzene	<0.020	0.020	ug/L							
1,1,2-Trichloroethane	<0.020	0.020	ug/L							
1,1,1-Trichloroethane	<0.020	0.020	ug/L							
Trichloroethylene (TCE)	<0.020	0.020	ug/L							
Trichlorofluoromethane (R11)	<0.020	0.020	ug/L							
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	<0.020	0.020	ug/L							
1,3,5-Trimethylbenzene	<0.020	0.020	ug/L							
1,2,4-Trimethylbenzene	<0.020	0.020	ug/L							
2,2,4-Trimethylpentane	<0.020	0.020	ug/L							
Vinyl acetate	<0.020	0.020	ug/L							
Vinyl bromide	<0.020	0.020	ug/L							

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0829 - *** DEFAULT PREP ****										
Blank (B6C0829-BLK1) Continued				Prepared & Analyzed: 02/26/16						
Vinyl chloride	<0.020	0.020	ug/L							
o-Xylene	<0.020	0.020	ug/L							
m,p-Xylenes	<0.020	0.020	ug/L							
1,2,3-Trichloropropane	<0.020	0.020	ug/L							
sec-Butylbenzene	<0.020	0.020	ug/L							
Isopropylbenzene	<0.020	0.020	ug/L							
n-Propylbenzene	<0.020	0.020	ug/L							
4-Isopropyltoluene	<0.020	0.020	ug/L							
n-Butylbenzene	<0.020	0.020	ug/L							
Surrogate: 4-Bromofluorobenzene	*0.119*		*ug/L*	*0.14*		*83.1*	*70-130*			
LCS (B6C0829-BS1)				Prepared & Analyzed: 02/26/16						
Acetone	**0.0235**	0.020	ug/L	0.024		98.9	70-130		30	
Benzene	**0.0375**	0.020	ug/L	0.032		118	70-130		30	
Benzyl chloride	**0.0703**	0.020	ug/L	0.052		136	70-130		30	**b
Bromodichloromethane	**0.0898**	0.020	ug/L	0.067		134	70-130		30	**b
Bromoform	**0.134**	0.020	ug/L	0.10		130	70-130		30	
Bromomethane	**0.0461**	0.020	ug/L	0.039		119	70-130		30	
2-Butanone (MEK)	**0.0109**	0.020	ug/L	0.029		36.9	70-130		30	
Carbon Disulfide	**0.0310**	0.020	ug/L	0.031		99.6	70-130		30	
Carbon Tetrachloride	**0.0873**	0.020	ug/L	0.063		139	70-130		30	**b
Chlorobenzene	**0.0594**	0.020	ug/L	0.046		129	70-130		30	
Chloroethane	**0.0265**	0.020	ug/L	0.026		101	70-130		30	
Chloroform	**0.0642**	0.020	ug/L	0.049		131	70-130		30	**b
Chloromethane	**0.0226**	0.020	ug/L	0.021		110	70-130		30	
Dibromochloromethane	**0.109**	0.020	ug/L	0.085		128	70-130		30	
1,2-Dibromoethane (EDB)	**0.0945**	0.020	ug/L	0.077		123	70-130		30	
1,2-Dichlorobenzene	**0.0872**	0.020	ug/L	0.060		145	70-130		30	**b
1,3-Dichlorobenzene	**0.0884**	0.020	ug/L	0.060		147	70-130		30	**b
1,4-Dichlorobenzene	**0.0839**	0.020	ug/L	0.060		140	70-130		30	**b
Dichlorodifluoromethane (R12)	**0.0599**	0.020	ug/L	0.049		121	70-130		30	
1,1-Dichloroethane	**0.0490**	0.020	ug/L	0.040		121	70-130		30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0829 - *** DEFAULT PREP ****										
LCS (B6C0829-BS1) Continued				Prepared & Analyzed: 02/26/16						
1,2-Dichloroethane (EDC)	**0.0503**	0.020	ug/L	0.040		124	70-130		30	
cis-1,2-Dichloroethylene	**0.0401**	0.020	ug/L	0.040		101	70-130		30	
1,1-Dichloroethylene	**0.0399**	0.020	ug/L	0.040		101	70-130		30	
trans-1,2-Dichloroethylene	**0.0442**	0.020	ug/L	0.040		112	70-130		30	
1,2-Dichloropropane	**0.0526**	0.020	ug/L	0.046		114	70-130		30	
trans-1,3-Dichloropropylene	**0.0497**	0.020	ug/L	0.045		109	70-130		30	
cis-1,3-Dichloropropylene	**0.0507**	0.020	ug/L	0.045		112	70-130		30	
Dichlorotetrafluoroethane	**0.0853**	0.020	ug/L	0.070		122	70-130		30	
Ethylbenzene	**0.0527**	0.020	ug/L	0.043		121	70-130		30	
4-Ethyltoluene	**0.0694**	0.020	ug/L	0.049		141	70-130		30	**b
Hexachlorobutadiene	**0.136**	0.020	ug/L	0.11		127	70-130		30	
Methylene Chloride	**0.0349**	0.020	ug/L	0.035		100	70-130		30	
Styrene	**0.0524**	0.020	ug/L	0.043		123	70-130		30	
1,1,2,2-Tetrachloroethane	**0.0983**	0.020	ug/L	0.069		143	70-130		30	**b
Tetrachloroethylene (PCE)	**0.0861**	0.020	ug/L	0.068		127	70-130		30	
Toluene	**0.0439**	0.020	ug/L	0.038		116	70-130		30	
1,2,4-Trichlorobenzene	**0.0865**	0.020	ug/L	0.074		116	70-130		30	
1,1,2-Trichloroethane	**0.0678**	0.020	ug/L	0.055		124	70-130		30	
1,1,1-Trichloroethane	**0.0698**	0.020	ug/L	0.055		128	70-130		30	
Trichloroethylene (TCE)	**0.0696**	0.020	ug/L	0.054		130	70-130		30	
Trichlorofluoromethane (R11)	**0.0720**	0.020	ug/L	0.056		128	70-130		30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.112**	0.020	ug/L	0.077		146	70-130		30	**b
1,3,5-Trimethylbenzene	**0.0692**	0.020	ug/L	0.049		141	70-130		30	**b
1,2,4-Trimethylbenzene	**0.0678**	0.020	ug/L	0.049		138	70-130		30	**b
Vinyl acetate	**0.0292**	0.020	ug/L	0.035		82.9	70-130		30	
Vinyl chloride	**0.0283**	0.020	ug/L	0.026		111	70-130		30	
o-Xylene	**0.0599**	0.020	ug/L	0.043		138	70-130		30	**b
m,p-Xylenes	**0.112**	0.020	ug/L	0.087		129	70-130		30	
1,2,3-Trichloropropane	**0.0953**	0.020	ug/L	0.060		158	70-130		30	**b
sec-Butylbenzene	**0.101**	0.020	ug/L	0.055		184	70-130		30	**b
Isopropylbenzene	**0.0827**	0.020	ug/L	0.049		168	70-130		30	**b

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0829 - *** DEFAULT PREP ****										
LCS (B6C0829-BS1) Continued				Prepared & Analyzed: 02/26/16						
n-Propylbenzene	**0.0851**	0.020	ug/L	0.049		173	70-130		30	**b
4-Isopropyltoluene	**0.0979**	0.020	ug/L	0.055		178	70-130		30	**b
Surrogate: 4-Bromofluorobenzene	*0.150*		*ug/L*	*0.14*		*105*	*70-130*			
LCS Dup (B6C0829-BSD1)				Prepared & Analyzed: 02/26/16						
Acetone	**0.0228**	0.020	ug/L	0.024		95.9	70-130	3.08	30	
Benzene	**0.0383**	0.020	ug/L	0.032		120	70-130	2.11	30	
Benzyl chloride	**0.0637**	0.020	ug/L	0.052		123	70-130	9.89	30	
Bromodichloromethane	**0.0801**	0.020	ug/L	0.067		120	70-130	11.4	30	
Bromoform	**0.125**	0.020	ug/L	0.10		121	70-130	7.02	30	
Bromomethane	**0.0427**	0.020	ug/L	0.039		110	70-130	7.61	30	
Carbon Disulfide	**0.0301**	0.020	ug/L	0.031		96.8	70-130	2.85	30	
Carbon Tetrachloride	**0.0767**	0.020	ug/L	0.063		122	70-130	13.0	30	
Chlorobenzene	**0.0577**	0.020	ug/L	0.046		125	70-130	2.99	30	
Chloroethane	**0.0264**	0.020	ug/L	0.026		100	70-130	0.398	30	
Chloroform	**0.0566**	0.020	ug/L	0.049		116	70-130	12.5	30	
Chloromethane	**0.0216**	0.020	ug/L	0.021		105	70-130	4.48	30	
Dibromochloromethane	**0.109**	0.020	ug/L	0.085		128	70-130	0.625	30	
1,2-Dibromoethane (EDB)	**0.0919**	0.020	ug/L	0.077		120	70-130	2.80	30	
1,2-Dichlorobenzene	**0.0772**	0.020	ug/L	0.060		128	70-130	12.1	30	
1,3-Dichlorobenzene	**0.0794**	0.020	ug/L	0.060		132	70-130	10.8	30	**b
1,4-Dichlorobenzene	**0.0765**	0.020	ug/L	0.060		127	70-130	9.15	30	
Dichlorodifluoromethane (R12)	**0.0552**	0.020	ug/L	0.049		112	70-130	8.16	30	
1,1-Dichloroethane	**0.0447**	0.020	ug/L	0.040		110	70-130	9.15	30	
1,2-Dichloroethane (EDC)	**0.0446**	0.020	ug/L	0.040		110	70-130	11.9	30	
cis-1,2-Dichloroethylene	**0.0457**	0.020	ug/L	0.040		115	70-130	12.9	30	
1,1-Dichloroethylene	**0.0372**	0.020	ug/L	0.040		93.7	70-130	7.10	30	
trans-1,2-Dichloroethylene	**0.0460**	0.020	ug/L	0.040		116	70-130	3.78	30	
1,2-Dichloropropane	**0.0543**	0.020	ug/L	0.046		118	70-130	3.20	30	
trans-1,3-Dichloropropylene	**0.0494**	0.020	ug/L	0.045		109	70-130	0.458	30	
cis-1,3-Dichloropropylene	**0.0512**	0.020	ug/L	0.045		113	70-130	0.890	30	
Dichlorotetrafluoroethane	**0.0820**	0.020	ug/L	0.070		117	70-130	3.93	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0829 - *** DEFAULT PREP ****										
LCS Dup (B6C0829-BSD1) Continued				Prepared & Analyzed: 02/26/16						
Ethylbenzene	**0.0528**	0.020	ug/L	0.043		122	70-130	0.165	30	
4-Ethyltoluene	**0.0623**	0.020	ug/L	0.049		127	70-130	10.7	30	
Hexachlorobutadiene	**0.132**	0.020	ug/L	0.11		124	70-130	2.79	30	
Isopropanol (IPA)	**0.0271**	0.20	ug/L	0.025		110	70-130	200	30	**b
Methylene Chloride	**0.0342**	0.020	ug/L	0.035		98.6	70-130	1.91	30	
Styrene	**0.0530**	0.020	ug/L	0.043		124	70-130	1.29	30	
1,1,2,2-Tetrachloroethane	**0.0855**	0.020	ug/L	0.069		125	70-130	13.9	30	
Tetrachloroethylene (PCE)	**0.0882**	0.020	ug/L	0.068		130	70-130	2.41	30	
Toluene	**0.0458**	0.020	ug/L	0.038		122	70-130	4.20	30	
1,2,4-Trichlorobenzene	**0.0871**	0.020	ug/L	0.074		117	70-130	0.770	30	
1,1,2-Trichloroethane	**0.0674**	0.020	ug/L	0.055		124	70-130	0.565	30	
1,1,1-Trichloroethane	**0.0641**	0.020	ug/L	0.055		117	70-130	8.64	30	
Trichloroethylene (TCE)	**0.0687**	0.020	ug/L	0.054		128	70-130	1.40	30	
Trichlorofluoromethane (R11)	**0.0651**	0.020	ug/L	0.056		116	70-130	10.1	30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**0.0874**	0.020	ug/L	0.077		114	70-130	24.6	30	
1,3,5-Trimethylbenzene	**0.0639**	0.020	ug/L	0.049		130	70-130	7.91	30	
1,2,4-Trimethylbenzene	**0.0622**	0.020	ug/L	0.049		127	70-130	8.54	30	
Vinyl acetate	**0.0362**	0.020	ug/L	0.035		103	70-130	21.5	30	
Vinyl chloride	**0.0275**	0.020	ug/L	0.026		108	70-130	2.75	30	
o-Xylene	**0.0529**	0.020	ug/L	0.043		122	70-130	12.5	30	
m,p-Xylenes	**0.110**	0.020	ug/L	0.087		127	70-130	1.56	30	
1,2,3-Trichloropropane	**0.0844**	0.020	ug/L	0.060		140	70-130	12.1	30	**b
sec-Butylbenzene	**0.0892**	0.020	ug/L	0.055		162	70-130	12.6	30	**b
Isopropylbenzene	**0.0766**	0.020	ug/L	0.049		156	70-130	7.71	30	**b
n-Propylbenzene	**0.0768**	0.020	ug/L	0.049		156	70-130	10.3	30	**b
4-Isopropyltoluene	**0.0910**	0.020	ug/L	0.055		166	70-130	7.27	30	**b
Surrogate: 4-Bromofluorobenzene	*0.138*		*ug/L*	*0.14*		*96.6*	*70-130*			
Duplicate (B6C0829-DUP1)				**Source: 6B29001-37** Prepared & Analyzed: 02/26/16						
Acetone	**<20**	20	ug/L		<20				30	
Allyl chloride	**<20**	20	ug/L		<20				30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0829 - *** DEFAULT PREP ****										
Duplicate (B6C0829-DUP1) Continued	**Source: 6B29001-37** Prepared & Analyzed: 02/26/16									
tert-Amyl Methyl Ether (TAME)	**<20**	20	ug/L		<20				30	
Benzene	**<20**	20	ug/L		<20				30	
Benzyl chloride	**<20**	20	ug/L		<20				30	
Bromodichloromethane	**<20**	20	ug/L		<20				30	
Bromoform	**<20**	20	ug/L		<20				30	
Bromomethane	**<20**	20	ug/L		<20				30	
1,3-Butadiene	**<20**	20	ug/L		<20				30	
2-Butanone (MEK)	**<20**	20	ug/L		<20				30	
tert-Butyl alcohol (TBA)	**<20000**	20000	ug/L		<20000				30	
Carbon Disulfide	**<20**	20	ug/L		<20				30	
Carbon Tetrachloride	**<20**	20	ug/L		<20				30	
Chlorobenzene	**<20**	20	ug/L		<20				30	
Chloroethane	**<20**	20	ug/L		<20				30	
Chloroform	**<20**	20	ug/L		<20				30	
Chloromethane	**<20**	20	ug/L		<20				30	
Cyclohexane	**20.9**	20	ug/L		20.6			1.49	30	
Dibromochloromethane	**<20**	20	ug/L		<20				30	
1,2-Dibromoethane (EDB)	**<20**	20	ug/L		<20				30	
1,2-Dichlorobenzene	**<20**	20	ug/L		<20				30	
1,3-Dichlorobenzene	**<20**	20	ug/L		<20				30	
1,4-Dichlorobenzene	**<20**	20	ug/L		<20				30	
Dichlorodifluoromethane (R12)	**<20**	20	ug/L		<20				30	
1,1-Dichloroethane	**<20**	20	ug/L		<20				30	
1,2-Dichloroethane (EDC)	**<20**	20	ug/L		<20				30	
cis-1,2-Dichloroethylene	**<20**	20	ug/L		<20				30	
1,1-Dichloroethylene	**<20**	20	ug/L		<20				30	
trans-1,2-Dichloroethylene	**<20**	20	ug/L		<20				30	
1,2-Dichloropropane	**<20**	20	ug/L		<20				30	
trans-1,3-Dichloropropylene	**<20**	20	ug/L		<20				30	
cis-1,3-Dichloropropylene	**<20**	20	ug/L		<20				30	
Dichlorotetrafluoroethane	**<20**	20	ug/L		<20				30	
Diisopropyl ether (DIPE)	**<20**	20	ug/L		<20				30	

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LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0829 - *** DEFAULT PREP ****										
Duplicate (B6C0829-DUP1) Continued	**Source: 6B29001-37**	Prepared & Analyzed: 02/26/16								
1,4-Dioxane	**<20**	20	ug/L		<20				30	
Ethanol	**<20**	20	ug/L		<20				30	
Ethyl Acetate	**<20**	20	ug/L		<20				30	
Ethylbenzene	**<20**	20	ug/L		<20				30	
Ethyl-tert-Butyl Ether (ETBE)	**<20**	20	ug/L		<20				30	
4-Ethyltoluene	**<20**	20	ug/L		<20				30	
Heptane	**73.4**	20	ug/L		76.4			3.99	30	
Hexachlorobutadiene	**<20**	20	ug/L		<20				30	
n-Hexane	**22.5**	20	ug/L		19.1			16.1	30	
2-Hexanone (MBK)	**<20**	20	ug/L		<20				30	
Isopropanol (IPA)	**<200**	200	ug/L		<200				30	
Methyl-tert-Butyl Ether (MTBE)	**<20**	20	ug/L		<20				30	
Methylene Chloride	**<20**	20	ug/L		<20				30	
4-Methyl-2-pentanone (MIBK)	**<20**	20	ug/L		<20				30	
Naphthalene	**<20**	20	ug/L		<20				30	
Propylene	**<20**	20	ug/L		<20				30	
Styrene	**<20**	20	ug/L		<20				30	
1,1,2,2-Tetrachloroethane	**<20**	20	ug/L		<20				30	
Tetrachloroethylene (PCE)	**<20**	20	ug/L		<20				30	
Tetrahydrofuran (THF)	**<20**	20	ug/L		<20				30	
Toluene	**343**	20	ug/L		362			5.51	30	
1,2,4-Trichlorobenzene	**<20**	20	ug/L		<20				30	
1,1,2-Trichloroethane	**<20**	20	ug/L		<20				30	
1,1,1-Trichloroethane	**<20**	20	ug/L		<20				30	
Trichloroethylene (TCE)	**<20**	20	ug/L		<20				30	
Trichlorofluoromethane (R11)	**<20**	20	ug/L		<20				30	
1,1,2-Trichloro-1,2,2-trifluoroethane (R113)	**<20**	20	ug/L		<20				30	
1,3,5-Trimethylbenzene	**<20**	20	ug/L		<20				30	
1,2,4-Trimethylbenzene	**<20**	20	ug/L		<20				30	
2,2,4-Trimethylpentane	**208**	20	ug/L		176			16.7	30	
Vinyl acetate	**<20**	20	ug/L		<20				30	

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LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
VOCs by GCMS EPA TO-15 - Quality Control										
*Batch B6C0829 - *** DEFAULT PREP ****										
Duplicate (B6C0829-DUP1) Continued	**Source: 6B29001-37**		Prepared & Analyzed: 02/26/16							
Vinyl bromide	**<20**	20	ug/L		<20				30	
Vinyl chloride	**<20**	20	ug/L		<20				30	
o-Xylene	**129**	20	ug/L		118			8.63	30	
m,p-Xylenes	**256**	20	ug/L		237			7.63	30	
1,2,3-Trichloropropane	**<20**	20	ug/L		<20				30	
sec-Butylbenzene	**<20**	20	ug/L		<20				30	
Isopropylbenzene	**<20**	20	ug/L		<20				30	
n-Propylbenzene	**<20**	20	ug/L		<20				30	
4-Isopropyltoluene	**<20**	20	ug/L		<20				30	
n-Butylbenzene	**<20**	20	ug/L		<20				30	
Surrogate: 4-Bromofluorobenzene	*0.128*		*ug/L*	*0.14*		*89.6*	*70-130*			
Fixed Gases by TCD - Quality Control										
*Batch B6C0833 - *** DEFAULT PREP ****										
Blank (B6C0833-BLK1)			Prepared & Analyzed: 02/24/16							
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B6C0833-BS1)			Prepared & Analyzed: 02/24/16							
Methane	**4.44**	0.10	% by Volume	4.5		98.6	75-125			
Oxygen	**4.24**	0.10	% by Volume	4.0		106	75-125			
Carbon Dioxide	**13.2**	0.10	% by Volume	15		88.2	75-125			
LCS Dup (B6C0833-BSD1)			Prepared & Analyzed: 02/24/16							
Methane	**4.46**	0.10	% by Volume	4.5		99.2	75-125	0.629	30	

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LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
*Batch B6C0833 - *** DEFAULT PREP ****										
LCS Dup (B6C0833-BSD1) Continued				Prepared & Analyzed: 02/24/16						
Oxygen	**4.35**	0.10	% by Volume	4.0		109	75-125	2.47	30	
Carbon Dioxide	**13.7**	0.10	% by Volume	15		91.5	75-125	3.72	30	
Duplicate (B6C0833-DUP1)		**Source: 6B29001-08**		Prepared & Analyzed: 02/24/16						
Methane	**<0.10**	0.10	% by Volume		<0.10				30	
Oxygen	**18.5**	0.10	% by Volume		18.6			0.210	30	
Carbon Dioxide	**<0.10**	0.10	% by Volume		<0.10				30	
*Batch B6C0834 - *** DEFAULT PREP ****										
Blank (B6C0834-BLK1)				Prepared & Analyzed: 02/25/16						
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B6C0834-BS1)				Prepared & Analyzed: 02/25/16						
Methane	**4.44**	0.10	% by Volume	4.5		98.6	75-125			
Oxygen	**3.99**	0.10	% by Volume	4.0		99.8	75-125			
Carbon Dioxide	**13.5**	0.10	% by Volume	15		90.0	75-125			
LCS Dup (B6C0834-BSD1)				Prepared & Analyzed: 02/25/16						
Methane	**4.60**	0.10	% by Volume	4.5		102	75-125	3.63	30	
Oxygen	**4.06**	0.10	% by Volume	4.0		101	75-125	1.61	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
*Batch B6C0834 - *** DEFAULT PREP ****										
LCS Dup (B6C0834-BSD1) Continued				Prepared & Analyzed: 02/25/16						
Carbon Dioxide	**13.6**	0.10	% by Volume	15		90.9	75-125	1.03	30	
Duplicate (B6C0834-DUP1)			**Source: 6B29001-18**	Prepared & Analyzed: 02/25/16						
Methane	**<0.10**	0.10	% by Volume		<0.10				30	
Oxygen	**10.7**	0.10	% by Volume		10.8			0.298	30	
Carbon Dioxide	**5.73**	0.10	% by Volume		5.88			2.62	30	
*Batch B6C0835 - *** DEFAULT PREP ****										
Blank (B6C0835-BLK1)				Prepared & Analyzed: 02/26/16						
Methane	<0.10	0.10	% by Volume							
Oxygen	<0.10	0.10	% by Volume							
Carbon Dioxide	<0.10	0.10	% by Volume							
LCS (B6C0835-BS1)				Prepared & Analyzed: 02/26/16						
Methane	**4.32**	0.10	% by Volume	4.5		96.1	75-125			
Oxygen	**4.49**	0.10	% by Volume	4.0		112	75-125			
Carbon Dioxide	**12.5**	0.10	% by Volume	15		83.1	75-125			
LCS Dup (B6C0835-BSD1)				Prepared & Analyzed: 02/26/16						
Methane	**4.50**	0.10	% by Volume	4.5		100	75-125	4.01	30	
Oxygen	**4.24**	0.10	% by Volume	4.0		106	75-125	5.61	30	
Carbon Dioxide	**13.1**	0.10	% by Volume	15		87.2	75-125	4.84	30	
Duplicate (B6C0835-DUP1)			**Source: 6B29001-37**	Prepared & Analyzed: 02/26/16						

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client: CH2M Hill, Inc.
Project No: 496965.A1.01
Project Name: KMEP Norwalk Biosparge Startup

AA Project No: MB187307
Date Received: 02/26/16
Date Reported: 03/11/16

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Fixed Gases by TCD - Quality Control										
*Batch B6C0835 - *** DEFAULT PREP ****										
Methane	**<0.10**	0.10	% by Volume		<0.10				30	
Oxygen	**16.2**	0.10	% by Volume		16.2			0.185	30	
Carbon Dioxide	**2.29**	0.10	% by Volume		2.34			2.03	30	

Allen Aminian
QA/QC Manager

LABORATORY ANALYSIS RESULTS

Client:	CH2M Hill, Inc.	**AA Project No:**	MB187307
Project No:	496965.A1.01	**Date Received:**	02/26/16
Project Name:	KMEP Norwalk Biosparge Startup	**Date Reported:**	03/11/16

Special Notes

[1] = ****** : a

[2] = ******* : Analyte recovery is below the lower control limit.

[3] = ****a** : Analyte recovery is Below the lower control limit.

[4] = ****b** : Recovery exceeds the upper control limit.

Allen Aminian
QA/QC Manager

AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311
Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.: 24522
70045329
Page 1 of 1

Client: CH2MHILL | Project Name / No.: KINDER MORGAN NORWALK | Sampler's Name: WILLIAM SCHROCK
Project Manager: | Site Address: 15306 NORWALK BLVD | Sampler's Signature:
Phone: | City: NORWALK | P.O. No.:
Fax: | State & Zip: CA. | Quote No.:

TAT Turnaround Codes **

(1) = Same Day Rush
(2) = 24 Hour Rush
(3) = 48 Hour Rush
(4) = 72 Hour Rush
(5) = 5 Day Rush
X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

Please enter the TAT Turnaround Codes ** below

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	TO15	TO3	FIXED GASES								Special Instructions
SVM-1-15	6B29001-1	2-24-16	0815	V	3	X	X	X								
SVM-1-8	-2		0829	V	3	X	X	X								
SVM-2-5	-3		0933	V	3	X	X	X								
SVM-15-7	-4		1018	V	3	X	X	X								
SVM-15-22	-5		1018	V	3	X	X	X								
SVM-15-15	-6		1030	V	3	X	X	X								
AMBIENT AIR	-7		1103	V	1	X	X									
SVM-6-15	-8		1107	V	3	X	X	X								
SVM-6-16 DUP	-9		1107	V	3	X	X	X								
SVM-6-7	-10		1115	V	3	X	X	X								
SVM-7-7	-11		1345	V	3	X	X	X								
SVM-7-13	-12		1408	V	3	X	X	X								
SVM-10-15	-13		1423	V	3	X	X	X								

For Laboratory Use

REVIEWED
Date 2/29/16 Time 9:58
TAT 5 Days Sign:

A.A. Project No.: MB187307/6B29001

Relinquished by	Date	Time	Received by
	2-24-16	1430	
	2/26/16	17:00	

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client-requested analyses performed on this project.

AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311
Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.: 124523
70045349
Page 1 of 1

Client: CH2M HILL | Project Name / No.: KINDER MORGAN NORWALK | Sampler's Name: WILLIAM SCHUCKLE
Project Manager: | Site Address: 15306 NORWALK BLVD | Sampler's Signature:
Phone: | City: NORWALK | P.O. No.:
Fax: | State & Zip: CA | Quote No.:

TAT Turnaround Codes **

(1) = Same Day Rush
(2) = 24 Hour Rush
(3) = 48 Hour Rush
(4) = 72 Hour Rush
(5) = 5 Day Rush
X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

Please enter the TAT Turnaround Codes ** below

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	TDS	TDM	CHLORIDES	Special Instructions
SVM-S-15	6B29001-14	2-25-16	0748	V	3	X	X	X	
SVM-S-S	-15		0801	V	3	X	X	X	
SVM-8-15	-16		0836	V	3	X	X	X	
SVM-8-S	-17		0847	V	3	X	X	X	
SVM-16-22	-18		0922	V	3	X	X	X	
SVM-16-22 DUP	-19		0922	V	3	X	X	X	
SVM-16-7	-20		0936	V	3	X	X	X	
SVM-16-16	-21		0948	V	3	X	X	X	
SVM-3-15	-22		1122	V	3	X	X	X	
SVM-3-S	-23		1148	V	3	X	X	X	
SVM-3-S DUP	-24		1148	V	2	X	X	X	
SVM-12-15	-25		1244	V	3	X	X	X	
AMBIENT AIR	-26		1253	V	1	X	X		
SVM-12-7	-27		1310	V	3	X	X	X	
SVM-12-22	-28		1320	V	3	X	X	X	

For Laboratory Use:
REVIEWED
Date 2/29/16 Time 9:58
TAT 5 Days Sign:

A.A. Project No.: MB1B7307 / 6B29001

Relinquished by	Date	Time	Received by
	2-25-16	1320	
	2/26/16	17:20	

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client-requested analyses performed on this project

AMERICAN ANALYTICS CHAIN-OF-CUSTODY RECORD

9765 ETON AVE., CHATSWORTH, CA 91311
Tel: 818-998-5547 FAX: 818-998-7258

A.A. COC No.: 124524

70045348

Client: CH2M HILL
Project Name / No.: KINDER MORGAN NORWALK
Sampler's Name: William Schoman[illegible]
Project Manager: DAN JABLONSKI
Site Address: 15306 NORWALK BLVD
Sampler's Signature: [signature]
Phone:
City: NORWALK
P.O. No.:
Fax:
State & Zip: CA
Quote No.:

TAT Turnaround Codes **

1 = Same Day Rush
2 = 24 Hour Rush
3 = 48 Hour Rush
4 = 72 Hour Rush
5 = 5 Day Rush
X = 10 Working Days (Standard TAT)

ANALYSIS REQUESTED (Test Name)

Please enter the TAT Turnaround Codes ** below

Client I.D.	A.A. I.D.	Date	Time	Sample Matrix	No. of Cont	RCS	RM	FIXED GASES							Special Instructions
SVM-11-22	6B29001-29	2-26-16	0809	V	3	X	X	X							
SVM-11-7	-30	↓	0811	V	3	X	X	X							
SVM-11-15	-31	↓	0821	V	3	X	X	X							
SVM-13-22.5	-32	↓	0911	V	3	X	X	X							
SVM-13-7	-33	↓	0913	V	3	X	X	X							
SVM-13-15.5	-34	↓	0928	V	3	X	X	X							
SVM-14-22	-35	↓	1028	V	3	X	X	X							
SVM-14-7	-36	↓	1035	V	3	X	X	X							
SVM-14-15	-37	↓	1050	V	3	X	X	X							
SVM-14-15 DUP	-38	↓	1050	V	2	X	X	X							
AMBIENT AIR	-39	↓	1113	V	1	X	X								

For Laboratory Use

REVIEWED
Date 2/29/16 Time 9:58
TAT 5 Days Sign: [signature]

A.A. Project No.: MB187307 / 6B29001

Relinquished by	Date	Time	Received by
[signature]	2-26-16	1305	[signature]
[signature]	2/26/16	17:00	[signature]

Note: By relinquishing samples to American Analytics, client agrees to pay for the services requested on this chain of custody form and any additional client requested analyses performed on this project.