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CITY OF SUNNYVALE
MASTER PLAN AND PRIMARY TREATMENT DESIGN
TECHNICAL MEMORANDUM
ODOR TESTING REPORT:
MASTER PLAN

FINAL
December 2013



CITY OF SUNNYVALE
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TECHNICAL MEMORANDUM
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ODOR TESTING REPORT: MASTER PLAN

1.0 INTRODUCTION/SUMMARY

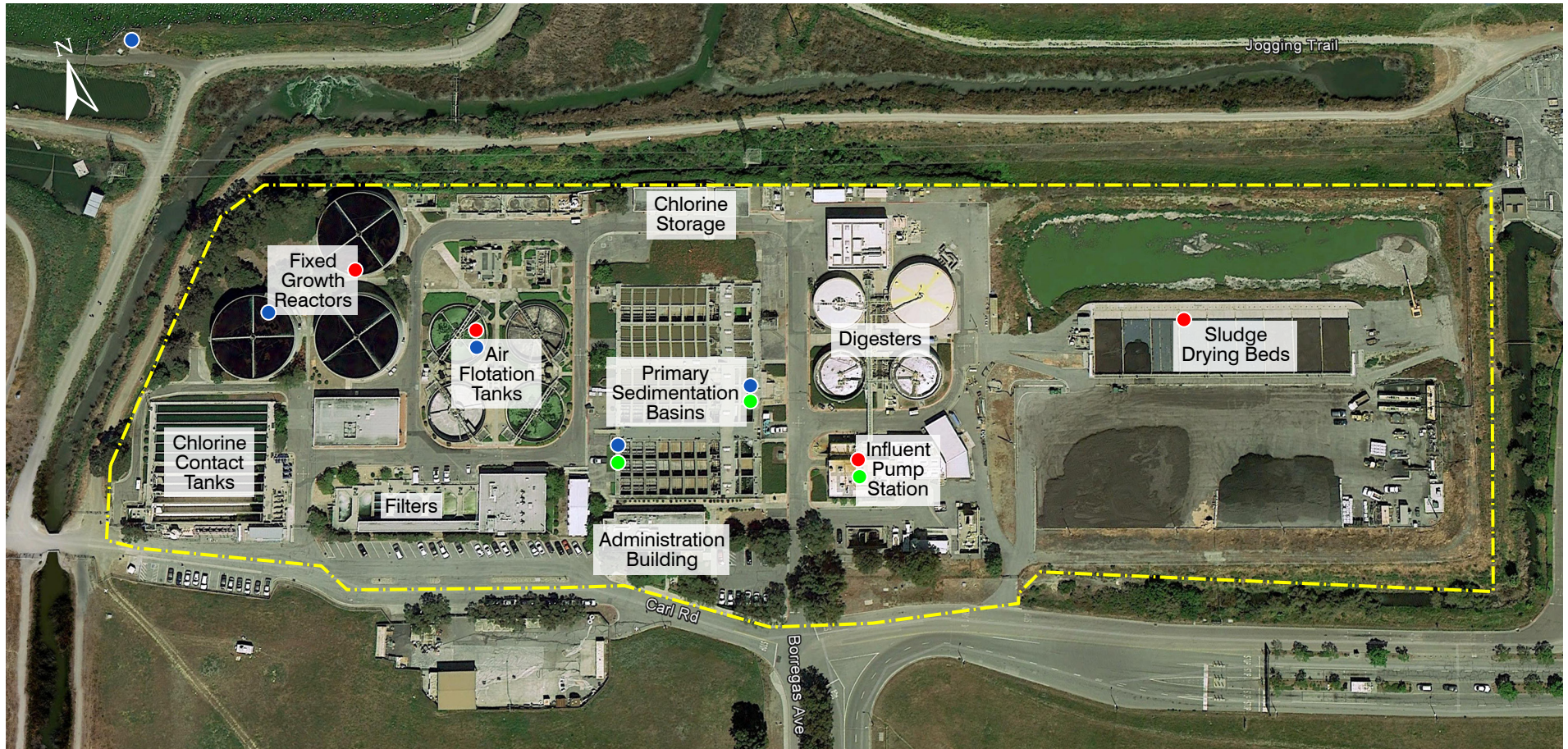
The City of Sunnyvale is currently in the process of upgrading their existing Water Pollution Control Plant (WPCP) as part of a master planning/primary facilities project. This includes the development of odor control strategies as part of preparing the near-term and long-term recommendations for process improvements to the WPCP. One of the assigned planning tasks is to provide “consideration of odor control and corrosion control systems” while performing the Master Plan analysis. In order to properly evaluate, select and size odor control systems it is necessary to know which odorous compounds are being emitted from each source and in what concentrations. On-site odor testing was performed at the WPCP on September 9 through 11, 2013. The weather conditions on the days of testing were mostly sunny with highs in the mid-80s and lows in the mid-60s. The purpose of this technical memorandum (TM) is to describe the testing that was performed, present the test results, and offer discussion on the meaning of the results and how they may impact recommendations for implementing odor control as part of the Master Plan and the Primary Treatment Facility design.

This TM does not include recommendation on odor control design criteria or an evaluation of odor control technologies. This analysis will be presented in a separate TM.

2.0 BACKGROUND

The Sunnyvale WPCP was initially built in the 1950s and with several additions throughout the years it has grown to a tertiary treatment facility with an average dry weather flow rate of 14 million gallons per day (mgd). The current treatment process includes aerated grit removal, ten primary sedimentation basins and two oxidation ponds covering about 440 acres which provide secondary treatment. Tertiary treatment is provided through three fixed growth reactors (FGR), four air flotation tanks (AFT) for algae removal, dual-media filtration, chlorine gas for disinfection, and sodium bisulfite for chlorine removal. The chlorine gas is currently in the process of being replaced with hypochlorite.

Biosolids are pumped to one of four anaerobic digesters. Digested biosolids are pumped to nine solar-tile dewatering beds. The solids sit in the dewatering beds for about three weeks before they are moved to an asphalt pad where they dry even further before they are stockpiled and eventually disposed of at the neighboring landfill. Refer to Figure 1 for a site plan of the facility.







Legend	
	Main WPCP Boundary
	Air Sample Locations
	Liquid Sample Locations
	Odialog H ₂ S Monitor Locations

Figure 1
SITE PLAN
 ODOR TESTING REPORT
 MASTER PLAN AND PRIMARY TREATMENT DESIGN
 CITY OF SUNNYVALE

3.0 DESCRIPTION OF TESTING

3.1 Testing Rational

The Sunnyvale WPCP wastewater treatment process is typical of other wastewater treatment plants (WWTPs) in some ways but quite unique in others. The influent pump station, primary sedimentation tanks, fixed growth reactors, filters and chlorine contact tanks are common to many plants but the 440 acre oxidation ponds, AFTs for algae removal and solids dewatering processes are unique. Odor testing at WWTPs is typically performed in areas that generate the most odors and H₂S emissions. These areas typically include the headworks, primary sedimentation tanks, solids handling facilities and potentially fixed growth reactors (trickling filters). As a result, the odor testing effort summarized herein was focused in these areas of the WPCP. The sample locations and the analyses were selected with care to identify and quantify the odor causing compounds at the WPCP.

Like most odor evaluations at WWTPs, the odor evaluation included liquid and air testing, as well as on-site hydrogen sulfide testing, in order to determine which compounds are present and in what concentrations. Air testing included reduced sulfur compound (RSC) and volatile organic compound (VOC) testing in order to determine which potentially odorous compounds were in the air and in what concentrations. This information is absolutely necessary when selecting and sizing odor control equipment. If an unusual compound, or a common compound with an unusually high concentration, is present and not accounted for in the selection and design of the odor control system, poor performance or system failure can occur. Liquid testing included various analyses to determine the potential for sulfide formation, which is a key parameter used to predict the potential for H₂S generation and release. Hydrogen sulfide testing was conducted because it is an indicator of odor that can be measured easily.

Odor panel testing is often conducted at WWTPs but was not performed on this project. Odor panel testing is most useful when the site must demonstrate compliance with regulatory odor guidelines. In Sunnyvale's case, no odor complaints have been received and no regulatory restrictions are in place, therefore, odor panel testing was deemed unnecessary. Furthermore, testing for RSC and VOC is considered to provide more useful data for the project.

3.2 Air Sample Collection Protocol

Air samples for RSC and VOC analyses were collected in three-liter chemically-inert Tedlar bags with a polypropylene access valve. Air samples from aerated sources, quiescent sources, and point sources were collected using a vacuum chamber and small battery-operated Teflon pump connected by tubing as shown in Figure 2. In all cases, the

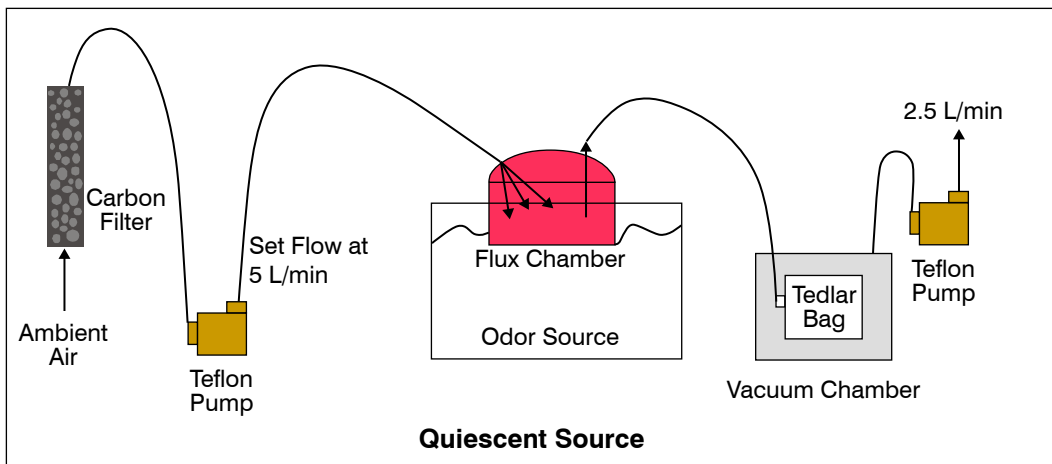
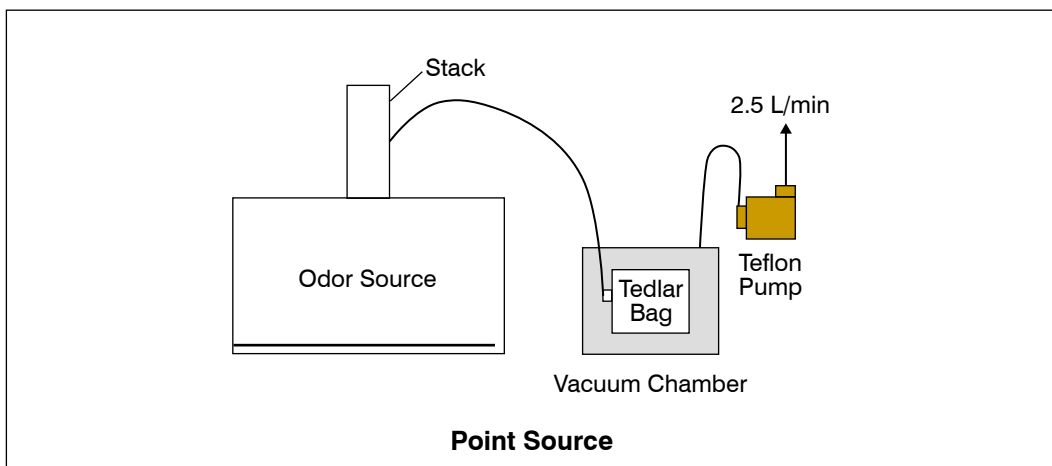
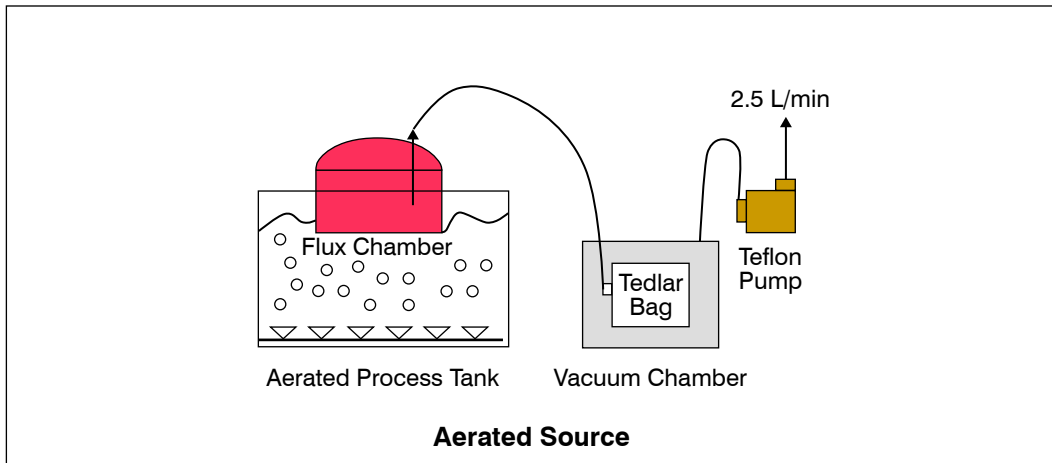


Figure 2
GAS SAMPLING TRAINS
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sample container was filled with the sample and then purged to “condition” the container and remove any background container contaminants prior to collection of the final sample for RSC and VOC analysis.

The air samples were collected from each source and shipped to ALS Environmental via overnight express courier where they were analyzed the following day.

3.3 Reduced Sulfur Compound Testing

The samples were analyzed for 20 sulfur compounds per ASTM D 5504-08 using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). All compounds with the exception of hydrogen sulfide and carbonyl sulfide are measured against the initial calibration curve for methyl mercaptan.

3.4 Volatile Organic Compound Testing

The samples were also analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. The analytical system was comprised of a gas chromatograph/mass spectrometer (GC/MS) interfaced to a whole-air pre-concentrator.

3.5 Hydrogen Sulfide (H₂S)

H₂S can be measured in the field using H₂S analyzers that provide instantaneous readings and/or continuous data logging. Since it is easy to measure, H₂S is often used in wastewater situations as an odor indicator. In many municipal wastewater applications when the H₂S is controlled, the odor problem will be eliminated. H₂S is slightly heavier than air and moderately soluble in water. H₂S dissolves in water and disassociates in accordance with the following reversible reaction:



The distribution of the above species is a function of pH, as shown graphically in Figure 3. The relative H₂S concentration increases with decreasing pH. Only the dissolved sulfides can escape from the liquid (as H₂S). Hydrogen sulfide is formed under anaerobic or septic (absence of oxygen) conditions.

On this project, H₂S was measured in the laboratory as part of the RSC analysis but it was also measured at three locations in the field using Odalog H₂S analyzers manufactured by Detection Instruments. The Odalog is an H₂S analyzer specifically designed to be installed in manholes and other harsh locations that will log the H₂S concentrations for up to 30 days at a time. The Odalog is useful because it will show diurnal H₂S patterns which cannot be captured with other instruments.

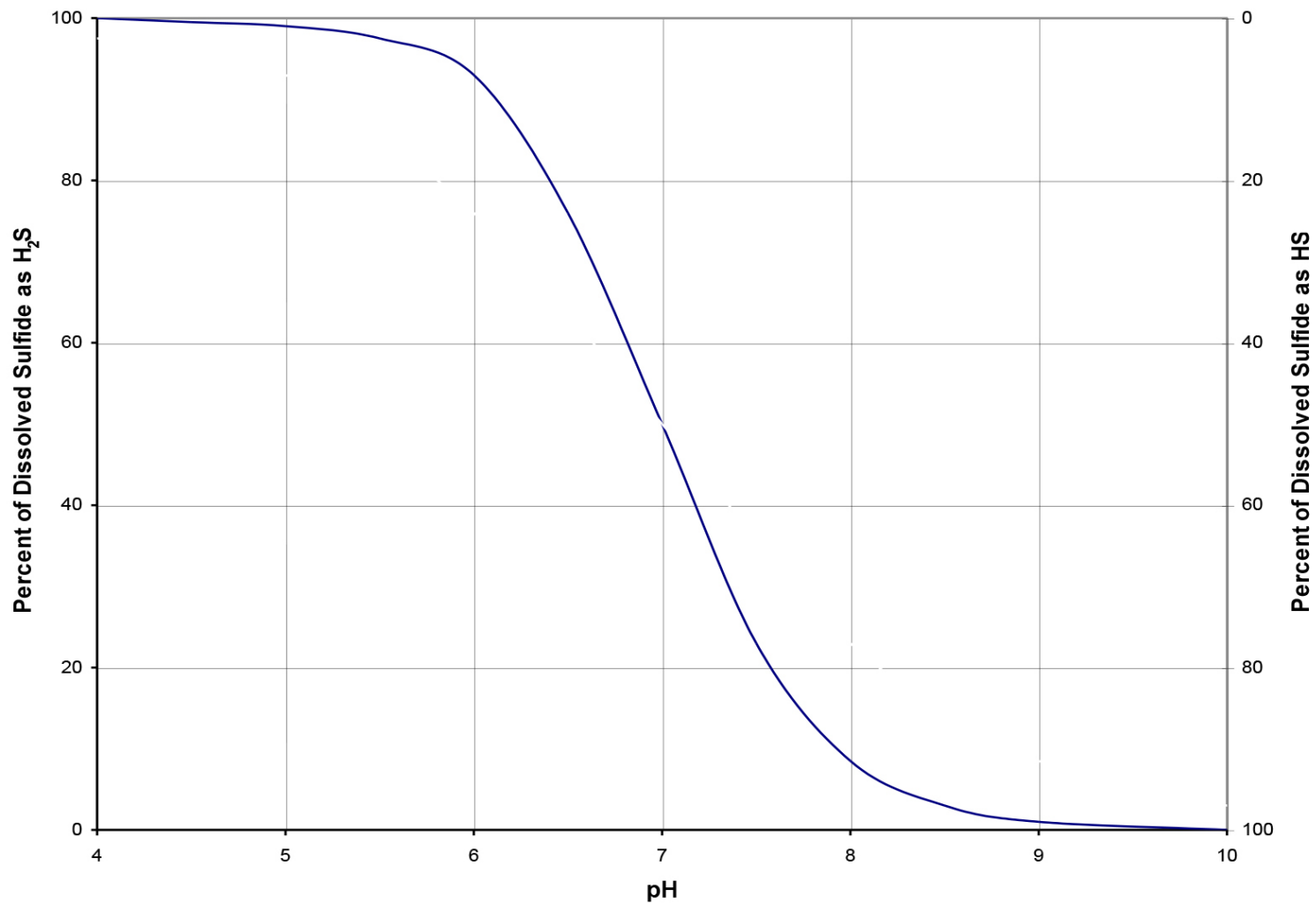


Figure 3
EFFECTS OF pH ON DISTRIBUTION OF H_2S IN WATER
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CITY OF SUNNYVALE

3.6 Wastewater Analysis

Sulfides, which are the dissolved liquid form of hydrogen sulfide, are formed biologically in the wastewater collection system in the absence of dissolved oxygen. Sulfates are reduced to sulfides in the absence of oxygen or nitrates (anaerobic conditions) in the slime layer of force mains and gravity sewers. H₂S is moderately soluble in water.

The rate of sulfide production by the slime layer is related to the following factors:

- Wastewater organic strength.
- Dissolved oxygen (D.O.).
- pH.
- Temperature.
- Velocity.
- Detention time in the force main or gravity sewer.

Within a D.O. range of 0.1 to 0.5 milligrams per liter (mg/L), anaerobic bacteria reduce sulfates to sulfides. Low velocities can promote the formation of thicker slime layers. As detention time increases, oxygen depletion occurs and the conditions favor sulfide production. The rate of sulfide production can double for every 10°C increase in temperature. pH governs the ratio of H₂S gas and ions in solution. Sulfide generation is directly proportional to detention time in the sewer.

The formation of sulfides is an important parameter when predicting the potential for H₂S generation and release. For this study, samples for sulfide analyses were collected to assist in locating the problem areas. In addition to analytical testing for sulfides, field measurements of pH, oxidation reduction potential (ORP), and temperature were made. The sulfides were measured in the wastewater using a LaMotte Sulfide Test Kit (Model P-70).

The pH and ORP of the wastewater was measured using a Digi-Sense Digital pH/ORP Meter (Model 5938-50). The ORP is measured in millivolts (mV) and is an indication of the potential to reduce sulfates to sulfides. In an aerobic environment, bacteria use dissolved oxygen for respiration and sulfate is not reduced to sulfide. In an anaerobic environment with a low ORP (less than zero), bacteria use the sulfate for respiration, reducing the sulfate to sulfide. The following are ranges of ORP:

ORP (mV)	Condition
+50	No action by anaerobic bacteria
0	Poor anaerobic bacteria activity
-100 to -200	Maximum efficiency for anaerobic bacteria activity
-50 to -300	Favored by sulfate reducing bacteria for production of sulfide

4.0 PRESENTATION OF TESTING RESULTS

4.1 Air Sampling Test Results

4.1.1 RSC/VOC Results

Four (4) emission points were selected for RSC/VOC sampling and testing based on experiences at similar WWTPs and a preliminary site survey. These locations are shown on Figure 1 and include the channel monster room exhaust at the influent pump station, fixed growth reactor exhaust, AFT effluent channel, and sludge drying beds. These locations were selected based on possible relevance to off-site odors, either because of high air flow rates, RSC/VOC potential or both. Table 1 lists the four sampling locations and the significance of each.

Table 1 Location and Description of RSC/VOC Samples Master Plan and Primary Treatment Design City of Sunnyvale	
Location	Description
Channel Monster Room Exhaust	A sample was taken from the exhaust fan on the roof of the primary building. The north fan was in service at the time of testing but the south fan was out of service. This fan draws air out of the channel monster room. Since this sample was essentially drawn from the headspace above the influent raw wastewater it was assumed that the RSC/VOC results for this source could be applied to the primary clarifiers.
Fixed Growth Reactor Exhaust	The FGRs are not covered and use four 5,000 cfm fans to supply the air needed to maintain the biological growth within the media. These fans are mounted on the side wall of the FGR beneath the media and continually blow about 20,000 cfm of air into the bottom of each FGR. The air is then discharged from the top of the tank through the media. On the day of testing, all three FGRs were in service. The air sample was collected from the surface of FGR No. 3 (unit that is furthest north) using the flux chamber. The water distribution system was turned off for about 10 minutes while the sample was collected.
AFT Effluent Channel	This sample was collected from AFT No. 3 which was the only one in service on the day of testing. The flux chamber was placed over the water surface in the effluent channel. These tanks receive effluent from the oxidation ponds and are used primarily for algae removal.
Solids Dewatering Beds	This sample was collected from the bed that had the most moisture. On the day of testing five of the ten beds were filled with biosolids at varying stages of dryness. The flux chamber was placed on top of the biosolids while the sample was collected.

The RSC/VOC Test results are summarized in Table 2 and the ALS reports are included in the Appendix.

Table 2 SC/VOC Test Results Summary Master Plan and Primary Treatment Design City of Sunnyvale					
Compound	RSC/VOC Concentration (ppbV)				
	MRL	Channel Monster Room Exhaust	Fixed Growth Reactor Exhaust	AFT Effluent Channel	Solids Dewatering Beds
Reduced Sulfur Compounds					
Hydrogen Sulfide	5	1,200	ND	ND	10.0
Methyl Mercaptan	5	30	ND	ND	ND
Volatile Organic Compounds					
Ethanol	27	220	29	ND	39
n-Hexane	1.4	ND	1.6	3.5	ND
Tetrahydrofuran (THF)	1.7	ND	ND	ND	2.8
Ethyl Acetate	2.8	2.8	ND	ND	ND
Chloroform	1.0	1.8	ND	ND	ND
Trichloroethene	0.93	0.9	ND	ND	ND
Toluene	1.3	8.7	10.0	11.0	8.9
n-Butyl Acetate	1.1	1.3	2.0	ND	1.3
Tetrachloroethene	0.74	1.5	2.1	2.5	1.6
m,p-Xylenes	2.3	ND	3.0	ND	ND
alpha-Pinene	0.9	1.1	1.6	1.9	1.4
d-Limonene	0.9	4.5	5.1	3.6	4
Note: (1) Laboratory RSC and VOC results are reported in parts-per-billion (ppb). ND indicates the results were below the method reporting limits (MRL) of the laboratory instrumentation.					

The RSC results indicate there was 1.2 parts per million (ppm) of H₂S and 0.03 ppm of methyl mercaptan (MM) in the air being exhausted from the channel monster room. There was no H₂S or MM coming from the fixed growth reactors or the AFT tanks and only 0.010 ppm of H₂S coming from the solids dewatering beds.

The VOC results indicate the presence of several compounds from each of the sampled locations, but the concentrations were all quite low and unlikely to be significantly contributors to off-site odor emissions.

4.1.2 Odialog H₂S Results

Three Odialogs were installed to measure H₂S concentrations from September 9 through 22, 2013. These Odialogs were installed on the channel monster room exhaust at the influent pump station, in the primary influent channel and in the primary effluent channel

as shown on Figure 1. These locations were selected after a preliminary walk-through of the plant with a Jerome H₂S analyzer (accurate down to 3 parts per billion) revealed these locations to have the highest potential for H₂S formation and release. The Odalogs are capable of measuring H₂S down to 1 ppm and are ineffective on sources with H₂S concentrations less than 1 ppm. The three monitored locations were the only three that showed the potential for significant H₂S release. The fixed growth reactors, oxidation ponds, AFTs and other sources showed little or no H₂S when tested with the Jerome. After the Odalogs were retrieved, the data was downloaded and the figures were created to show H₂S concentrations throughout the monitoring period. The Odalogs were programmed to log a reading every 60 seconds throughout the period.

Figures 3, 4 and 5 are Odalog charts that show the H₂S concentrations throughout the monitoring period at the channel room exhaust, the primary influent channel, and the primary effluent channel sampling locations respectively. As shown in Figure 4, the channel monster room exhaust had an average H₂S concentration of 0.36 ppm and a peak of 2 ppm. Note, this odalog chart has a slightly different appearance than the other two Odalog charts because the Odalog that was used in this location had a higher range of measurement (0-1,000 ppm) and was only capable of logging H₂S concentrations in whole numbers (1.0 or 2.0, not 1.2).

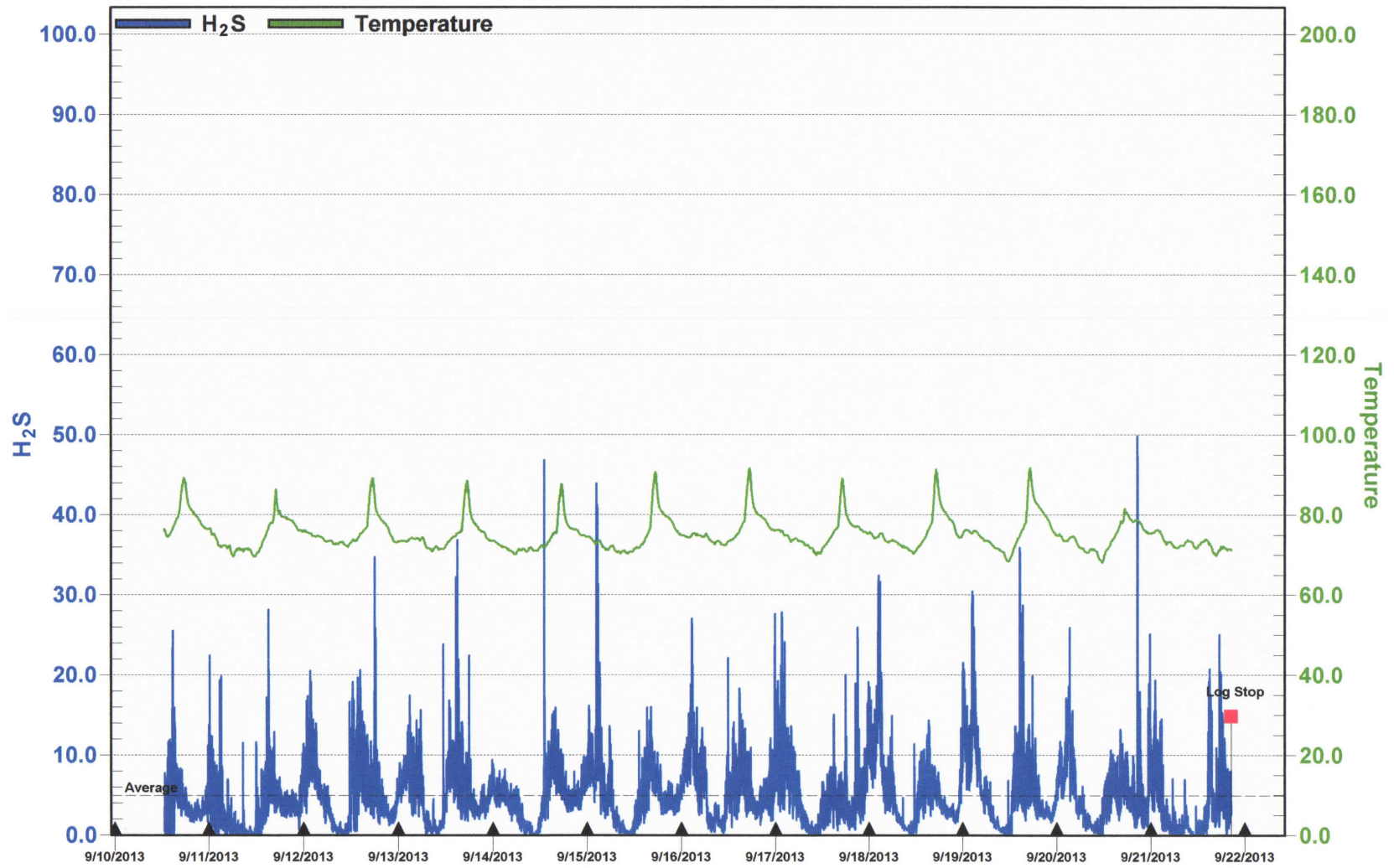
The primary influent channel had an average H₂S concentration of 4.9 ppm and a peak of 49.8 ppm, as shown on Figure 5. This figure shows fairly routine spikes that occur at about 6:00 a.m. and again at about 6:00 p.m.

The primary effluent channel had an average H₂S concentration of 8 ppm and a peak of 35 ppm, as shown on Figure 6. The spikes in the effluent channel routinely occurred at about 8:00 a.m. and 8:00 p.m. The two hour difference from the influent channel can be attributed to the time it takes for the water to pass through the primaries.

4.2 Liquid Sampling Test Results

Liquid samples were collected from the following locations and tested for pH, ORP, total sulfides and temperature. These locations are shown on Figure 1 and were selected because they were the only locations that appeared to have the potential for sulfide generation.

- Primary influent.
- Primary effluent.
- Fixed growth reactor influent.
- Oxidation pond.
- AFT effluent.



Period Displayed: 9/9/2013 - 9/22/2013 (Oda File: 20130926_OL05071501_01 Primary Influent.oda -- Serial Number: OL05071501)

Average 4.9PPM
▲ Day Transition
Min 0.0PPM Max 49.8PPM (Use Screen Data Only)

Figure 5
PRIMARY INFLUENT CHANNEL ODOLOG CHART
ODOR TESTING REPORT
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CITY OF SUNNYVALE

The liquid sampling test results are shown on Table 3. The pH of the primary influent and effluent was consistently in the 7.4 to 7.8 range which is quite good and means that about 85 percent of the sulfides are in the form of HS⁻ instead of H₂S as shown in Figure 3. The pH of the FGR influent and AFT effluent was greater than 8 indicating little opportunity for H₂S release from these sources.

The ORP of the primary influent and effluent ranged from -140 to -201 mV. Anaerobic bacteria are very efficient in this range and the potential to reduce sulfates to sulfides is certainly present. The H₂S measured using the Odalogs reflects this. The ORP of the FGR influent and AFT effluent was -50 and -45, respectively. In this range there would be little anaerobic bacteria activity.

The primary influent and effluent total sulfide concentrations ranged from 0.5 to 1.0 mg/L. While these concentrations are not considered high, they are certainly high enough to result in significant atmospheric H₂S. No total sulfides were measured in the FGR influent, AFT effluent or in the oxidation pond. These three sources have little potential for H₂S production and release.

5.0 OBSERVATIONS/DISCUSSION OF RESULTS

Based on a walk-through of the WPCP, raw wastewater odors were detected in the vicinity of the headworks facilities and primary clarifiers, but no odors were detected in any other area of the plant. The headworks and primary clarifier odors were not overpowering, but they were certainly noticeable and capable of being detected off-site depending on the wind direction.

Following this walk-through (and subjective analysis), the field testing that was performed corroborated the subjective odor analysis by showing that the headworks and primary facilities have relatively high H₂S concentrations and that the other downstream processes have almost no H₂S/RSC/VOC or even the potential to create these compounds.

The RSC/VOC test results show that there are no unusual compounds in concentrations that would lead to significant odor emissions or affect the performance of odor control systems that could be installed as part of the plant improvements.

Significant reduced sulfur compounds are most commonly seen in biosolids handling processes. In this case, there seemed to be little, if any, gas escaping from the anaerobic digesters and the solids in the dewatering beds were emitting almost no RSC. Therefore, the current solids handling processes at the plant are very good from an odor perspective.

The test results indicate the FGRs and AFTs do not present a significant odor risk.

Table 3 Liquid Test Results Master Plan and Primary Treatment Design City of Sunnyvale																
Location	September 10 (10:15 am)				September 10 (1:15 pm)				September 11 (8:10 am)				September 11 (11:45 am)			
	Temp (°F)	pH	ORP (mv)	TS (mg/L)	Temp (°F)	pH	ORP (mv)	TS (mg/L)	Temp (°F)	pH	ORP (mv)	TS (mg/L)	Temp (°F)	pH	ORP (mv)	TS (mg/L)
Primary Influent	75			0.5	74	7.56	-169	0.7	75	7.81	-143	0.4	78	7.6	-201	1.0
Primary Effluent	74			0.5	78	7.41	-165	0.8	75	7.47	-140	0.5	78	7.6	-192	0.9
FGR Influent	70			0.0	76	9.04	-50	0.0								
AFT Effluent					75	8.11	-45	0.0								
Oxidation Pond	73			0.0												

Legend: Temp – Temperature, ORP – Oxidation Reduction Potential, TS – Total Sulfides

The oxidation ponds cover about 440 acres and have a significant amount of settled solids. These ponds are always full and the solids are never exposed to the atmosphere since the water provides a odor containment cap. As long as the ponds remain full, there is little risk of significant odors being emitted from them except perhaps in the spring and fall when temperatures change and the ponds could potentially turnover. When this happens the water on the bottom (near the solids) comes to the top and odors could be released in the process. This is not uncommon in oxidation ponds, but was not occurring during September testing period. There was no apparent odor coming from the ponds but ponds could turn over at least twice per year and could off-gas for a short period at that time. The off-gassing would typically last no more than seven days.

New headworks facilities and primary sedimentation basins would be designed and constructed during the next phase of this project. Based on the field testing report, provisions for odor containment and treatment should be provided. The existing odors and relatively high H₂S concentrations in the vicinity of the headworks and primaries indicate off-site odor detection is not only possible, when the new facilities are constructed, but probable. The new processes would be similar to the current processes and there is no reason to believe the new facilities would have fewer emissions than the current facility. During preliminary design, a determination would be made as to the level of odor containment and control that would be provided based on the final layout configurations of the headworks and primary facilities.

New biosolids handling facilities are expected to be designed and constructed in the near future. The process configurations for these new facilities are currently under consideration, and would include new thickening and dewatering facilities and potentially more digesters. Based on experience at other facilities, the thickening and dewatering facilities handling would require some level of odor control depending on the processes, technologies and locations that are ultimately selected (this will be addressed as part of each specific process TM).

APPENDIX - ALS ENVIRONMENTAL RSC/VOC REPORTS



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LABORATORY REPORT

September 24, 2013

Bruce Koetter
Webster Environmental Associates
13121 Eastpoint Park Blvd., Suite E
Louisville, KY 40223

RE: Sunnyvale

Dear Bruce:

Enclosed are the results of the samples submitted to our laboratory on September 12, 2013. For your reference, these analyses have been assigned our service request number P1304046.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Kate Aguilera at 7:54 am, Sep 26, 2013

Kate Aguilera
Project Manager



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Client: Webster Environmental Associates
Project: Sunnyvale

Service Request No: P1304046

CASE NARRATIVE

The samples were received intact under chain of custody on September 12, 2013 and were stored in accordance with the analytical method requirements. The samples were received past the recommended holding time for the sulfur analysis. The analysis was performed as soon as possible after receipt by the laboratory. The data is flagged to indicate the holding time exceedance. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Sulfur Analysis

The samples were analyzed for twenty sulfur compounds per ASTM D 5504-08 using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). All compounds with the exception of hydrogen sulfide and carbonyl sulfide are quantitated against the initial calibration curve for methyl mercaptan. This method is not included on the laboratory's NELAP, DoD-ELAP, or AIHA-LAP scope of accreditation.

Volatile Organic Compound Analysis

The samples were also analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. The analytical system was comprised of a gas chromatograph/mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. According to the method, the use of Tedlar bags is considered a method modification. This method is not included on the laboratory's AIHA-LAP scope of accreditation. Any analytes flagged with an X are not included on the laboratory's NELAP or DoD-ELAP scope of accreditation.

The reporting limits have been elevated for sample DAF Effluent Weir (P1304046-003). The chromatogram indicated the presence of non-target background components. The sample was diluted in order to prevent damage to the instrument and to achieve optimal resolution of the target analytes.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.



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ALS Environmental – Simi Valley
 Certifications, Accreditations, and Registrations

Agency	Web Site	Number
AIHA	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
DoD ELAP	http://www.pjlabs.com/search-accredited-labs	L11-203
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2012039
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	581572
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	CA200007
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-13-4
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA01627201 3-3
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Webster Environmental Associates
 Project ID: Sunnyvale

Service Request: P1304046

Date Received: 9/12/2013
 Time Received: 10:00

ASTM D5504-08 - Sulfur Bag	TO-15 Modified - VOC-Bags
----------------------------	---------------------------

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	ASTM D5504-08 - Sulfur Bag	TO-15 Modified - VOC-Bags
Sludge Bed Surface	P1304046-001	Air	9/11/2013	09:00	X	X
Fan on Roof of Primary	P1304046-002	Air	9/11/2013	09:20	X	X
DAF Effluent Weir	P1304046-003	Air	9/11/2013	09:40	X	X
Fixed Growth Reactor #3	P1304046-004	Air	9/11/2013	10:00	X	X



Air - Chain of Custody Record & Analytical Service Request

2655 Park Center Drive, Suite A
 Simi Valley, California 93065
 Phone (805) 626-7161
 Fax (805) 626-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

ALS Project No. P13010416

Company Name & Address (Reporting Information) <u>Webster Environmental 13121 Eastpoint PK Blvd. Louisville, KY 40223</u>				Project Name <u>Sunnyvale</u>				ALS Contact		Comments e.g. Actual Preservative or specific instructions
Project Manager <u>Bruce Koetter</u>				Project Number				Analysis Method		
Phone <u>502-419-5762</u>		Fax		P.O. # / Billing Information				<u>TO-15 Reduced Sulfur Compounds</u>		
Email Address for Result Reporting <u>bruce.koetter@odor.net</u>				Sampler (Print & Sign) <u>Bruce Koetter Bruce Koetter</u>						
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume		
<u>Sludge Bed Surface</u>	<u>①</u>	<u>9/11/13</u>	<u>9:00</u>					<u>3L</u>	<u>X</u>	
<u>For a Rest of Primary</u>	<u>②</u>	<u>"</u>	<u>9:20</u>					<u>3L</u>	<u>X</u>	
<u>DAF Effluent Weir</u>	<u>③</u>	<u>"</u>	<u>9:40</u>					<u>3L</u>	<u>X</u>	
<u>Fixed Growth Reactor #3</u>	<u>④</u>	<u>"</u>	<u>10:00</u>					<u>3L</u>	<u>X</u>	
Report Tier Levels - please select										
Tier I - Results (Default if not specified)		Tier III (Results + QC & Calibration Summaries)		EDD required Yes / No		Chain of Custody Seal: (Circle)		Project Requirements (MRLs, QAPP)		
Tier II (Results + QC Summaries)		Tier IV (Data Validation Package) 10% Surcharge		Type: _____ Units: _____		INTACT BROKEN <u>ABSENT</u>				
Relinquished by: (Signature) <u>Bruce Koetter</u>		Date: <u>9/11/13</u>	Time: <u>2:00p</u>	Received by: (Signature) <u>[Signature]</u>		Date: <u>9/11/13</u>	Time: <u>1:00p</u>			
Relinquished by: (Signature)		Date:	Time:	Received by: (Signature)		Date:	Time:	Cooler / Blank Temperature °C		

P.1
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 8210
 Webster Environmental
 Sep 11 2013 1:53PM

**ALS Environmental
Sample Acceptance Check Form**

Client: Webster Environmental Associates

Work order: P1304046

Project: Sunnyvale

Sample(s) received on: 9/12/13

Date opened: 9/12/13

by: MZAMORA

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- | | Yes | No | N/A |
|--|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were sample containers properly marked with client sample ID? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 Container(s) supplied by ALS ? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3 Did sample containers arrive in good condition? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 Were chain-of-custody papers used and filled out? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 Did sample container labels and/or tags agree with custody papers? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6 Was sample volume received adequate for analysis? | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7 Are samples within specified holding times? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 8 Was proper temperature (thermal preservation) of cooler at receipt adhered to? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9 Was a trip blank received? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10 Were custody seals on outside of cooler/Box? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were custody seals on outside of sample container? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Location of seal(s)? _____ Sealing Lid? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were signature and date included? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were seals intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11 Do containers have appropriate preservation , according to method/SOP or Client specified information? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Is there a client indication that the submitted samples are pH preserved? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Were VOA vials checked for presence/absence of air bubbles? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12 Tubes: Are the tubes capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Do they contain moisture? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13 Badges: Are the badges properly capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1304046-001.01	3 L Zefon Bag					
P1304046-002.01	3 L Zefon Bag					
P1304046-003.01	3 L Zefon Bag					
P1304046-004.01	3 L Zefon Bag					

Explain any discrepancies: (include lab sample ID numbers): _____

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Webster Environmental Associates
Client Sample ID: Sludge Bed Surface
Client Project ID: Sunnyvale

ALS Project ID: P1304046
 ALS Sample ID: P1304046-001

Test Code: ASTM D 5504-08
 Instrument ID: Agilent 6890A/GC13/SCD
 Analyst: Mike Conejo
 Sample Type: 3 L Zefon Bag
 Test Notes: **H3**

Date Collected: 9/11/13
 Time Collected: 09:00
 Date Received: 9/12/13
 Date Analyzed: 9/12/13
 Time Analyzed: 12:30
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	14	7.0	10	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

H3 = Sample was received and analyzed past holding time.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Webster Environmental Associates
Client Sample ID: Fan on Roof of Primary
Client Project ID: Sunnyvale

ALS Project ID: P1304046
 ALS Sample ID: P1304046-002

Test Code: ASTM D 5504-08
 Instrument ID: Agilent 6890A/GC13/SCD
 Analyst: Mike Conejo
 Sample Type: 3 L Zefon Bag
 Test Notes: **H3**

Date Collected: 9/11/13
 Time Collected: 09:20
 Date Received: 9/12/13
 Date Analyzed: 9/12/13
 Time Analyzed: 12:47
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	1,600	7.0	1,200	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	58	9.8	30	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

H3 = Sample was received and analyzed past holding time.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Webster Environmental Associates
Client Sample ID: DAF Effluent Weir
Client Project ID: Sunnyvale

ALS Project ID: P1304046
 ALS Sample ID: P1304046-003

Test Code: ASTM D 5504-08
 Instrument ID: Agilent 6890A/GC13/SCD
 Analyst: Mike Conejo
 Sample Type: 3 L Zefon Bag
 Test Notes: **H3**

Date Collected: 9/11/13
 Time Collected: 09:40
 Date Received: 9/12/13
 Date Analyzed: 9/12/13
 Time Analyzed: 13:02
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

H3 = Sample was received and analyzed past holding time.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Webster Environmental Associates
Client Sample ID: Fixed Growth Reactor #3
Client Project ID: Sunnyvale

ALS Project ID: P1304046
 ALS Sample ID: P1304046-004

Test Code: ASTM D 5504-08
 Instrument ID: Agilent 6890A/GC13/SCD
 Analyst: Mike Conejo
 Sample Type: 3 L Zefon Bag
 Test Notes: **H3**

Date Collected: 9/11/13
 Time Collected: 10:00
 Date Received: 9/12/13
 Date Analyzed: 9/12/13
 Time Analyzed: 13:23
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

H3 = Sample was received and analyzed past holding time.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Webster Environmental Associates
Client Sample ID: Method Blank
Client Project ID: Sunnyvale

ALS Project ID: P1304046
 ALS Sample ID: P130912-MB

Test Code: ASTM D 5504-08
 Instrument ID: Agilent 6890A/GC13/SCD
 Analyst: Mike Conejo
 Sample Type: 3 L Zefon Bag
 Test Notes:

Date Collected: NA
 Time Collected: NA
 Date Received: NA
 Date Analyzed: 9/12/13
 Time Analyzed: 08:14
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: Webster Environmental Associates
Client Sample ID: Lab Control Sample
Client Project ID: Sunnyvale

ALS Project ID: P1304046
ALS Sample ID: P130912-LCS

Test Code: ASTM D 5504-08
Instrument ID: Agilent 6890A/GC13/SCD
Analyst: Mike Conejo
Sample Type: 3 L Zefon Bag
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 9/12/13
Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS Acceptance Limits	Data Qualifier
7783-06-4	Hydrogen Sulfide	2,050	2,150	105	63-140	
463-58-1	Carbonyl Sulfide	2,020	2,200	109	63-138	
74-93-1	Methyl Mercaptan	1,890	2,240	119	63-144	

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: Webster Environmental Associates
Client Sample ID: Sludge Bed Surface
Client Project ID: Sunnyvale

ALS Project ID: P1304046
 ALS Sample ID: P1304046-001

Test Code: EPA TO-15 Modified
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8
 Analyst: Lusine Hakobyan
 Sample Type: 3 L Zefon Bag
 Test Notes:

Date Collected: 9/11/13
 Date Received: 9/12/13
 Date Analyzed: 9/12/13
 Volume(s) Analyzed: 0.10 Liter(s)

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	5.0	ND	2.9	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	5.0	ND	1.0	
74-87-3	Chloromethane	ND	5.0	ND	2.4	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	5.0	ND	0.72	
75-01-4	Vinyl Chloride	ND	5.0	ND	2.0	
106-99-0	1,3-Butadiene	ND	5.0	ND	2.3	
74-83-9	Bromomethane	ND	5.0	ND	1.3	
75-00-3	Chloroethane	ND	5.0	ND	1.9	
64-17-5	Ethanol	73	50	39	27	
75-05-8	Acetonitrile	ND	5.0	ND	3.0	
107-02-8	Acrolein	ND	20	ND	8.7	
67-64-1	Acetone	ND	50	ND	21	
75-69-4	Trichlorofluoromethane	ND	5.0	ND	0.89	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	50	ND	20	
107-13-1	Acrylonitrile	ND	5.0	ND	2.3	
75-35-4	1,1-Dichloroethene	ND	5.0	ND	1.3	
75-09-2	Methylene Chloride	ND	5.0	ND	1.4	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	5.0	ND	1.6	
76-13-1	Trichlorotrifluoroethane	ND	5.0	ND	0.65	
75-15-0	Carbon Disulfide	ND	50	ND	16	
156-60-5	trans-1,2-Dichloroethene	ND	5.0	ND	1.3	
75-34-3	1,1-Dichloroethane	ND	5.0	ND	1.2	
1634-04-4	Methyl tert-Butyl Ether	ND	5.0	ND	1.4	
108-05-4	Vinyl Acetate	ND	50	ND	14	
78-93-3	2-Butanone (MEK)	ND	50	ND	17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: Webster Environmental Associates
Client Sample ID: Sludge Bed Surface
Client Project ID: Sunnyvale

ALS Project ID: P1304046
 ALS Sample ID: P1304046-001

Test Code: EPA TO-15 Modified
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8
 Analyst: Lusine Hakobyan
 Sample Type: 3 L Zefon Bag
 Test Notes:

Date Collected: 9/11/13
 Date Received: 9/12/13
 Date Analyzed: 9/12/13
 Volume(s) Analyzed: 0.10 Liter(s)

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	5.0	ND	1.3	
141-78-6	Ethyl Acetate	ND	10	ND	2.8	
110-54-3	n-Hexane	ND	5.0	ND	1.4	
67-66-3	Chloroform	ND	5.0	ND	1.0	
109-99-9	Tetrahydrofuran (THF)	8.4	5.0	2.8	1.7	
107-06-2	1,2-Dichloroethane	ND	5.0	ND	1.2	
71-55-6	1,1,1-Trichloroethane	ND	5.0	ND	0.92	
71-43-2	Benzene	ND	5.0	ND	1.6	
56-23-5	Carbon Tetrachloride	ND	5.0	ND	0.80	
110-82-7	Cyclohexane	ND	10	ND	2.9	
78-87-5	1,2-Dichloropropane	ND	5.0	ND	1.1	
75-27-4	Bromodichloromethane	ND	5.0	ND	0.75	
79-01-6	Trichloroethene	ND	5.0	ND	0.93	
123-91-1	1,4-Dioxane	ND	5.0	ND	1.4	
80-62-6	Methyl Methacrylate	ND	10	ND	2.4	
142-82-5	n-Heptane	ND	5.0	ND	1.2	
10061-01-5	cis-1,3-Dichloropropene	ND	5.0	ND	1.1	
108-10-1	4-Methyl-2-pentanone	ND	5.0	ND	1.2	
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	ND	1.1	
79-00-5	1,1,2-Trichloroethane	ND	5.0	ND	0.92	
108-88-3	Toluene	33	5.0	8.9	1.3	
591-78-6	2-Hexanone	ND	5.0	ND	1.2	
124-48-1	Dibromochloromethane	ND	5.0	ND	0.59	
106-93-4	1,2-Dibromoethane	ND	5.0	ND	0.65	
123-86-4	n-Butyl Acetate	6.2	5.0	1.3	1.1	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: Webster Environmental Associates
Client Sample ID: Sludge Bed Surface
Client Project ID: Sunnyvale

ALS Project ID: P1304046
 ALS Sample ID: P1304046-001

Test Code: EPA TO-15 Modified
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8
 Analyst: Lusine Hakobyan
 Sample Type: 3 L Zefon Bag
 Test Notes:

Date Collected: 9/11/13
 Date Received: 9/12/13
 Date Analyzed: 9/12/13
 Volume(s) Analyzed: 0.10 Liter(s)

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	5.0	ND	1.1	
127-18-4	Tetrachloroethene	11	5.0	1.6	0.74	
108-90-7	Chlorobenzene	ND	5.0	ND	1.1	
100-41-4	Ethylbenzene	ND	5.0	ND	1.2	
179601-23-1	m,p-Xylenes	ND	10	ND	2.3	
75-25-2	Bromoform	ND	5.0	ND	0.48	
100-42-5	Styrene	ND	5.0	ND	1.2	
95-47-6	o-Xylene	ND	5.0	ND	1.2	
111-84-2	n-Nonane	ND	5.0	ND	0.95	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	ND	0.73	
98-82-8	Cumene	ND	5.0	ND	1.0	
80-56-8	alpha-Pinene	7.9	5.0	1.4	0.90	
103-65-1	n-Propylbenzene	ND	5.0	ND	1.0	
622-96-8	4-Ethyltoluene	ND	5.0	ND	1.0	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	ND	1.0	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	ND	1.0	
100-44-7	Benzyl Chloride	ND	5.0	ND	0.97	
541-73-1	1,3-Dichlorobenzene	ND	5.0	ND	0.83	
106-46-7	1,4-Dichlorobenzene	ND	5.0	ND	0.83	
95-50-1	1,2-Dichlorobenzene	ND	5.0	ND	0.83	
5989-27-5	d-Limonene	23	5.0	4.2	0.90	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ND	0.52	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ND	0.67	
91-20-3	Naphthalene	ND	5.0	ND	0.95	
87-68-3	Hexachlorobutadiene	ND	5.0	ND	0.47	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: Webster Environmental Associates

Client Sample ID: Fan on Roof of Primary

Client Project ID: Sunnyvale

ALS Project ID: P1304046

ALS Sample ID: P1304046-002

Test Code: EPA TO-15 Modified

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Analyst: Lusine Hakobyan

Sample Type: 3 L Zefon Bag

Test Notes:

Date Collected: 9/11/13

Date Received: 9/12/13

Date Analyzed: 9/12/13

Volume(s) Analyzed: 0.10 Liter(s)

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m ³	µg/m ³	ppbV	ppbV	
115-07-1	Propene	ND	5.0	ND	2.9	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	5.0	ND	1.0	
74-87-3	Chloromethane	ND	5.0	ND	2.4	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	5.0	ND	0.72	
75-01-4	Vinyl Chloride	ND	5.0	ND	2.0	
106-99-0	1,3-Butadiene	ND	5.0	ND	2.3	
74-83-9	Bromomethane	ND	5.0	ND	1.3	
75-00-3	Chloroethane	ND	5.0	ND	1.9	
64-17-5	Ethanol	410	50	220	27	
75-05-8	Acetonitrile	ND	5.0	ND	3.0	
107-02-8	Acrolein	ND	20	ND	8.7	
67-64-1	Acetone	ND	50	ND	21	
75-69-4	Trichlorofluoromethane	ND	5.0	ND	0.89	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	50	ND	20	
107-13-1	Acrylonitrile	ND	5.0	ND	2.3	
75-35-4	1,1-Dichloroethene	ND	5.0	ND	1.3	
75-09-2	Methylene Chloride	ND	5.0	ND	1.4	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	5.0	ND	1.6	
76-13-1	Trichlorotrifluoroethane	ND	5.0	ND	0.65	
75-15-0	Carbon Disulfide	ND	50	ND	16	
156-60-5	trans-1,2-Dichloroethene	ND	5.0	ND	1.3	
75-34-3	1,1-Dichloroethane	ND	5.0	ND	1.2	
1634-04-4	Methyl tert-Butyl Ether	ND	5.0	ND	1.4	
108-05-4	Vinyl Acetate	ND	50	ND	14	
78-93-3	2-Butanone (MEK)	ND	50	ND	17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: Webster Environmental Associates

Client Sample ID: Fan on Roof of Primary

Client Project ID: Sunnyvale

ALS Project ID: P1304046

ALS Sample ID: P1304046-002

Test Code: EPA TO-15 Modified

Date Collected: 9/11/13

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: 9/12/13

Analyst: Lusine Hakobyan

Date Analyzed: 9/12/13

Sample Type: 3 L Zefon Bag

Volume(s) Analyzed: 0.10 Liter(s)

Test Notes:

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	5.0	ND	1.3	
141-78-6	Ethyl Acetate	10	10	2.8	2.8	
110-54-3	n-Hexane	ND	5.0	ND	1.4	
67-66-3	Chloroform	8.9	5.0	1.8	1.0	
109-99-9	Tetrahydrofuran (THF)	ND	5.0	ND	1.7	
107-06-2	1,2-Dichloroethane	ND	5.0	ND	1.2	
71-55-6	1,1,1-Trichloroethane	ND	5.0	ND	0.92	
71-43-2	Benzene	ND	5.0	ND	1.6	
56-23-5	Carbon Tetrachloride	ND	5.0	ND	0.80	
110-82-7	Cyclohexane	ND	10	ND	2.9	
78-87-5	1,2-Dichloropropane	ND	5.0	ND	1.1	
75-27-4	Bromodichloromethane	ND	5.0	ND	0.75	
79-01-6	Trichloroethene	5.0	5.0	0.93	0.93	
123-91-1	1,4-Dioxane	ND	5.0	ND	1.4	
80-62-6	Methyl Methacrylate	ND	10	ND	2.4	
142-82-5	n-Heptane	ND	5.0	ND	1.2	
10061-01-5	cis-1,3-Dichloropropene	ND	5.0	ND	1.1	
108-10-1	4-Methyl-2-pentanone	ND	5.0	ND	1.2	
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	ND	1.1	
79-00-5	1,1,2-Trichloroethane	ND	5.0	ND	0.92	
108-88-3	Toluene	33	5.0	8.7	1.3	
591-78-6	2-Hexanone	ND	5.0	ND	1.2	
124-48-1	Dibromochloromethane	ND	5.0	ND	0.59	
106-93-4	1,2-Dibromoethane	ND	5.0	ND	0.65	
123-86-4	n-Butyl Acetate	6.2	5.0	1.3	1.1	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: Webster Environmental Associates
Client Sample ID: Fan on Roof of Primary
Client Project ID: Sunnyvale

ALS Project ID: P1304046
 ALS Sample ID: P1304046-002

Test Code: EPA TO-15 Modified
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8
 Analyst: Lusine Hakobyan
 Sample Type: 3 L Zefon Bag
 Test Notes:

Date Collected: 9/11/13
 Date Received: 9/12/13
 Date Analyzed: 9/12/13
 Volume(s) Analyzed: 0.10 Liter(s)

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	5.0	ND	1.1	
127-18-4	Tetrachloroethene	10	5.0	1.5	0.74	
108-90-7	Chlorobenzene	ND	5.0	ND	1.1	
100-41-4	Ethylbenzene	ND	5.0	ND	1.2	
179601-23-1	m,p-Xylenes	ND	10	ND	2.3	
75-25-2	Bromoform	ND	5.0	ND	0.48	
100-42-5	Styrene	ND	5.0	ND	1.2	
95-47-6	o-Xylene	ND	5.0	ND	1.2	
111-84-2	n-Nonane	ND	5.0	ND	0.95	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	ND	0.73	
98-82-8	Cumene	ND	5.0	ND	1.0	
80-56-8	alpha-Pinene	6.3	5.0	1.1	0.90	
103-65-1	n-Propylbenzene	ND	5.0	ND	1.0	
622-96-8	4-Ethyltoluene	ND	5.0	ND	1.0	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	ND	1.0	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	ND	1.0	
100-44-7	Benzyl Chloride	ND	5.0	ND	0.97	
541-73-1	1,3-Dichlorobenzene	ND	5.0	ND	0.83	
106-46-7	1,4-Dichlorobenzene	ND	5.0	ND	0.83	
95-50-1	1,2-Dichlorobenzene	ND	5.0	ND	0.83	
5989-27-5	d-Limonene	25	5.0	4.5	0.90	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ND	0.52	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ND	0.67	
91-20-3	Naphthalene	ND	5.0	ND	0.95	
87-68-3	Hexachlorobutadiene	ND	5.0	ND	0.47	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: Webster Environmental Associates

Client Sample ID: DAF Effluent Weir

Client Project ID: Sunnyvale

ALS Project ID: P1304046

ALS Sample ID: P1304046-003

Test Code: EPA TO-15 Modified

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Analyst: Lusine Hakobyan

Sample Type: 3 L Zefon Bag

Test Notes:

Date Collected: 9/11/13

Date Received: 9/12/13

Date Analyzed: 9/12/13

Volume(s) Analyzed: 0.050 Liter(s)

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	10	ND	5.8	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	10	ND	2.0	
74-87-3	Chloromethane	ND	10	ND	4.8	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	10	ND	1.4	
75-01-4	Vinyl Chloride	ND	10	ND	3.9	
106-99-0	1,3-Butadiene	ND	10	ND	4.5	
74-83-9	Bromomethane	ND	10	ND	2.6	
75-00-3	Chloroethane	ND	10	ND	3.8	
64-17-5	Ethanol	ND	100	ND	53	
75-05-8	Acetonitrile	ND	10	ND	6.0	
107-02-8	Acrolein	ND	40	ND	17	
67-64-1	Acetone	ND	100	ND	42	
75-69-4	Trichlorofluoromethane	ND	10	ND	1.8	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	100	ND	41	
107-13-1	Acrylonitrile	ND	10	ND	4.6	
75-35-4	1,1-Dichloroethene	ND	10	ND	2.5	
75-09-2	Methylene Chloride	ND	10	ND	2.9	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	10	ND	3.2	
76-13-1	Trichlorotrifluoroethane	ND	10	ND	1.3	
75-15-0	Carbon Disulfide	ND	100	ND	32	
156-60-5	trans-1,2-Dichloroethene	ND	10	ND	2.5	
75-34-3	1,1-Dichloroethane	ND	10	ND	2.5	
1634-04-4	Methyl tert-Butyl Ether	ND	10	ND	2.8	
108-05-4	Vinyl Acetate	ND	100	ND	28	
78-93-3	2-Butanone (MEK)	ND	100	ND	34	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: Webster Environmental Associates

Client Sample ID: DAF Effluent Weir

Client Project ID: Sunnyvale

ALS Project ID: P1304046

ALS Sample ID: P1304046-003

Test Code: EPA TO-15 Modified

Date Collected: 9/11/13

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: 9/12/13

Analyst: Lusine Hakobyan

Date Analyzed: 9/12/13

Sample Type: 3 L Zefon Bag

Volume(s) Analyzed: 0.050 Liter(s)

Test Notes:

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	10	ND	2.5	
141-78-6	Ethyl Acetate	ND	20	ND	5.6	
110-54-3	n-Hexane	12	10	3.5	2.8	
67-66-3	Chloroform	ND	10	ND	2.0	
109-99-9	Tetrahydrofuran (THF)	ND	10	ND	3.4	
107-06-2	1,2-Dichloroethane	ND	10	ND	2.5	
71-55-6	1,1,1-Trichloroethane	ND	10	ND	1.8	
71-43-2	Benzene	ND	10	ND	3.1	
56-23-5	Carbon Tetrachloride	ND	10	ND	1.6	
110-82-7	Cyclohexane	ND	20	ND	5.8	
78-87-5	1,2-Dichloropropane	ND	10	ND	2.2	
75-27-4	Bromodichloromethane	ND	10	ND	1.5	
79-01-6	Trichloroethene	ND	10	ND	1.9	
123-91-1	1,4-Dioxane	ND	10	ND	2.8	
80-62-6	Methyl Methacrylate	ND	20	ND	4.9	
142-82-5	n-Heptane	ND	10	ND	2.4	
10061-01-5	cis-1,3-Dichloropropene	ND	10	ND	2.2	
108-10-1	4-Methyl-2-pentanone	ND	10	ND	2.4	
10061-02-6	trans-1,3-Dichloropropene	ND	10	ND	2.2	
79-00-5	1,1,2-Trichloroethane	ND	10	ND	1.8	
108-88-3	Toluene	43	10	11	2.7	
591-78-6	2-Hexanone	ND	10	ND	2.4	
124-48-1	Dibromochloromethane	ND	10	ND	1.2	
106-93-4	1,2-Dibromoethane	ND	10	ND	1.3	
123-86-4	n-Butyl Acetate	ND	10	ND	2.1	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: Webster Environmental Associates
Client Sample ID: DAF Effluent Weir
Client Project ID: Sunnyvale

ALS Project ID: P1304046
 ALS Sample ID: P1304046-003

Test Code: EPA TO-15 Modified
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8
 Analyst: Lusine Hakobyan
 Sample Type: 3 L Zefon Bag
 Test Notes:

Date Collected: 9/11/13
 Date Received: 9/12/13
 Date Analyzed: 9/12/13
 Volume(s) Analyzed: 0.050 Liter(s)

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	10	ND	2.1	
127-18-4	Tetrachloroethene	17	10	2.5	1.5	
108-90-7	Chlorobenzene	ND	10	ND	2.2	
100-41-4	Ethylbenzene	ND	10	ND	2.3	
179601-23-1	m,p-Xylenes	ND	20	ND	4.6	
75-25-2	Bromoform	ND	10	ND	0.97	
100-42-5	Styrene	ND	10	ND	2.3	
95-47-6	o-Xylene	ND	10	ND	2.3	
111-84-2	n-Nonane	ND	10	ND	1.9	
79-34-5	1,1,2,2-Tetrachloroethane	ND	10	ND	1.5	
98-82-8	Cumene	ND	10	ND	2.0	
80-56-8	alpha-Pinene	11	10	1.9	1.8	
103-65-1	n-Propylbenzene	ND	10	ND	2.0	
622-96-8	4-Ethyltoluene	ND	10	ND	2.0	
108-67-8	1,3,5-Trimethylbenzene	ND	10	ND	2.0	
95-63-6	1,2,4-Trimethylbenzene	ND	10	ND	2.0	
100-44-7	Benzyl Chloride	ND	10	ND	1.9	
541-73-1	1,3-Dichlorobenzene	ND	10	ND	1.7	
106-46-7	1,4-Dichlorobenzene	ND	10	ND	1.7	
95-50-1	1,2-Dichlorobenzene	ND	10	ND	1.7	
5989-27-5	d-Limonene	20	10	3.6	1.8	
96-12-8	1,2-Dibromo-3-chloropropane	ND	10	ND	1.0	
120-82-1	1,2,4-Trichlorobenzene	ND	10	ND	1.3	
91-20-3	Naphthalene	ND	10	ND	1.9	
87-68-3	Hexachlorobutadiene	ND	10	ND	0.94	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: Webster Environmental Associates

Client Sample ID: Fixed Growth Reactor #3

Client Project ID: Sunnyvale

ALS Project ID: P1304046

ALS Sample ID: P1304046-004

Test Code: EPA TO-15 Modified

Date Collected: 9/11/13

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: 9/12/13

Analyst: Lusine Hakobyan

Date Analyzed: 9/12/13

Sample Type: 3 L Zefon Bag

Volume(s) Analyzed: 0.10 Liter(s)

Test Notes:

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m ³	µg/m ³	ppbV	ppbV	
115-07-1	Propene	ND	5.0	ND	2.9	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	5.0	ND	1.0	
74-87-3	Chloromethane	ND	5.0	ND	2.4	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	5.0	ND	0.72	
75-01-4	Vinyl Chloride	ND	5.0	ND	2.0	
106-99-0	1,3-Butadiene	ND	5.0	ND	2.3	
74-83-9	Bromomethane	ND	5.0	ND	1.3	
75-00-3	Chloroethane	ND	5.0	ND	1.9	
64-17-5	Ethanol	55	50	29	27	
75-05-8	Acetonitrile	ND	5.0	ND	3.0	
107-02-8	Acrolein	ND	20	ND	8.7	
67-64-1	Acetone	ND	50	ND	21	
75-69-4	Trichlorofluoromethane	ND	5.0	ND	0.89	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	50	ND	20	
107-13-1	Acrylonitrile	ND	5.0	ND	2.3	
75-35-4	1,1-Dichloroethene	ND	5.0	ND	1.3	
75-09-2	Methylene Chloride	ND	5.0	ND	1.4	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	5.0	ND	1.6	
76-13-1	Trichlorotrifluoroethane	ND	5.0	ND	0.65	
75-15-0	Carbon Disulfide	ND	50	ND	16	
156-60-5	trans-1,2-Dichloroethene	ND	5.0	ND	1.3	
75-34-3	1,1-Dichloroethane	ND	5.0	ND	1.2	
1634-04-4	Methyl tert-Butyl Ether	ND	5.0	ND	1.4	
108-05-4	Vinyl Acetate	ND	50	ND	14	
78-93-3	2-Butanone (MEK)	ND	50	ND	17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: Webster Environmental Associates

Client Sample ID: Fixed Growth Reactor #3

Client Project ID: Sunnyvale

ALS Project ID: P1304046

ALS Sample ID: P1304046-004

Test Code: EPA TO-15 Modified

Date Collected: 9/11/13

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: 9/12/13

Analyst: Lusine Hakobyan

Date Analyzed: 9/12/13

Sample Type: 3 L Zefon Bag

Volume(s) Analyzed: 0.10 Liter(s)

Test Notes:

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	5.0	ND	1.3	
141-78-6	Ethyl Acetate	ND	10	ND	2.8	
110-54-3	n-Hexane	5.6	5.0	1.6	1.4	
67-66-3	Chloroform	ND	5.0	ND	1.0	
109-99-9	Tetrahydrofuran (THF)	ND	5.0	ND	1.7	
107-06-2	1,2-Dichloroethane	ND	5.0	ND	1.2	
71-55-6	1,1,1-Trichloroethane	ND	5.0	ND	0.92	
71-43-2	Benzene	ND	5.0	ND	1.6	
56-23-5	Carbon Tetrachloride	ND	5.0	ND	0.80	
110-82-7	Cyclohexane	ND	10	ND	2.9	
78-87-5	1,2-Dichloropropane	ND	5.0	ND	1.1	
75-27-4	Bromodichloromethane	ND	5.0	ND	0.75	
79-01-6	Trichloroethene	ND	5.0	ND	0.93	
123-91-1	1,4-Dioxane	ND	5.0	ND	1.4	
80-62-6	Methyl Methacrylate	ND	10	ND	2.4	
142-82-5	n-Heptane	ND	5.0	ND	1.2	
10061-01-5	cis-1,3-Dichloropropene	ND	5.0	ND	1.1	
108-10-1	4-Methyl-2-pentanone	ND	5.0	ND	1.2	
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	ND	1.1	
79-00-5	1,1,2-Trichloroethane	ND	5.0	ND	0.92	
108-88-3	Toluene	38	5.0	10	1.3	
591-78-6	2-Hexanone	ND	5.0	ND	1.2	
124-48-1	Dibromochloromethane	ND	5.0	ND	0.59	
106-93-4	1,2-Dibromoethane	ND	5.0	ND	0.65	
123-86-4	n-Butyl Acetate	9.6	5.0	2.0	1.1	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: Webster Environmental Associates
Client Sample ID: Fixed Growth Reactor #3
Client Project ID: Sunnyvale

ALS Project ID: P1304046
 ALS Sample ID: P1304046-004

Test Code: EPA TO-15 Modified
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8
 Analyst: Lusine Hakobyan
 Sample Type: 3 L Zefon Bag
 Test Notes:

Date Collected: 9/11/13
 Date Received: 9/12/13
 Date Analyzed: 9/12/13
 Volume(s) Analyzed: 0.10 Liter(s)

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	5.0	ND	1.1	
127-18-4	Tetrachloroethene	14	5.0	2.1	0.74	
108-90-7	Chlorobenzene	ND	5.0	ND	1.1	
100-41-4	Ethylbenzene	ND	5.0	ND	1.2	
179601-23-1	m,p-Xylenes	13	10	3.0	2.3	
75-25-2	Bromoform	ND	5.0	ND	0.48	
100-42-5	Styrene	ND	5.0	ND	1.2	
95-47-6	o-Xylene	ND	5.0	ND	1.2	
111-84-2	n-Nonane	ND	5.0	ND	0.95	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	ND	0.73	
98-82-8	Cumene	ND	5.0	ND	1.0	
80-56-8	alpha-Pinene	9.1	5.0	1.6	0.90	
103-65-1	n-Propylbenzene	ND	5.0	ND	1.0	
622-96-8	4-Ethyltoluene	ND	5.0	ND	1.0	
108-67-8	1,3,5-Trimethylbenzene	ND	5.0	ND	1.0	
95-63-6	1,2,4-Trimethylbenzene	ND	5.0	ND	1.0	
100-44-7	Benzyl Chloride	ND	5.0	ND	0.97	
541-73-1	1,3-Dichlorobenzene	ND	5.0	ND	0.83	
106-46-7	1,4-Dichlorobenzene	ND	5.0	ND	0.83	
95-50-1	1,2-Dichlorobenzene	ND	5.0	ND	0.83	
5989-27-5	d-Limonene	29	5.0	5.1	0.90	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ND	0.52	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ND	0.67	
91-20-3	Naphthalene	ND	5.0	ND	0.95	
87-68-3	Hexachlorobutadiene	ND	5.0	ND	0.47	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: Webster Environmental Associates

Client Sample ID: Method Blank

Client Project ID: Sunnyvale

ALS Project ID: P1304046

ALS Sample ID: P130912-MB

Test Code: EPA TO-15 Modified

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Analyst: Lusine Hakobyan

Sample Type: 3 L Zefon Bag

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 9/12/13

Volume(s) Analyzed: 1.00 Liter(s)

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m ³	µg/m ³	ppbV	ppbV	
115-07-1	Propene	ND	0.50	ND	0.29	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.50	ND	0.10	
74-87-3	Chloromethane	ND	0.50	ND	0.24	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.50	ND	0.072	
75-01-4	Vinyl Chloride	ND	0.50	ND	0.20	
106-99-0	1,3-Butadiene	ND	0.50	ND	0.23	
74-83-9	Bromomethane	ND	0.50	ND	0.13	
75-00-3	Chloroethane	ND	0.50	ND	0.19	
64-17-5	Ethanol	ND	5.0	ND	2.7	
75-05-8	Acetonitrile	ND	0.50	ND	0.30	
107-02-8	Acrolein	ND	2.0	ND	0.87	
67-64-1	Acetone	ND	5.0	ND	2.1	
75-69-4	Trichlorofluoromethane	ND	0.50	ND	0.089	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	5.0	ND	2.0	
107-13-1	Acrylonitrile	ND	0.50	ND	0.23	
75-35-4	1,1-Dichloroethene	ND	0.50	ND	0.13	
75-09-2	Methylene Chloride	ND	0.50	ND	0.14	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.50	ND	0.16	
76-13-1	Trichlorotrifluoroethane	ND	0.50	ND	0.065	
75-15-0	Carbon Disulfide	ND	5.0	ND	1.6	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	ND	0.13	
75-34-3	1,1-Dichloroethane	ND	0.50	ND	0.12	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
108-05-4	Vinyl Acetate	ND	5.0	ND	1.4	
78-93-3	2-Butanone (MEK)	ND	5.0	ND	1.7	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: Webster Environmental Associates

Client Sample ID: Method Blank

Client Project ID: Sunnyvale

ALS Project ID: P1304046

ALS Sample ID: P130912-MB

Test Code: EPA TO-15 Modified

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Analyst: Lusine Hakobyan

Sample Type: 3 L Zefon Bag

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 9/12/13

Volume(s) Analyzed: 1.00 Liter(s)

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.50	ND	0.13	
141-78-6	Ethyl Acetate	ND	1.0	ND	0.28	
110-54-3	n-Hexane	ND	0.50	ND	0.14	
67-66-3	Chloroform	ND	0.50	ND	0.10	
109-99-9	Tetrahydrofuran (THF)	ND	0.50	ND	0.17	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-55-6	1,1,1-Trichloroethane	ND	0.50	ND	0.092	
71-43-2	Benzene	ND	0.50	ND	0.16	
56-23-5	Carbon Tetrachloride	ND	0.50	ND	0.080	
110-82-7	Cyclohexane	ND	1.0	ND	0.29	
78-87-5	1,2-Dichloropropane	ND	0.50	ND	0.11	
75-27-4	Bromodichloromethane	ND	0.50	ND	0.075	
79-01-6	Trichloroethene	ND	0.50	ND	0.093	
123-91-1	1,4-Dioxane	ND	0.50	ND	0.14	
80-62-6	Methyl Methacrylate	ND	1.0	ND	0.24	
142-82-5	n-Heptane	ND	0.50	ND	0.12	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	ND	0.11	
108-10-1	4-Methyl-2-pentanone	ND	0.50	ND	0.12	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	ND	0.11	
79-00-5	1,1,2-Trichloroethane	ND	0.50	ND	0.092	
108-88-3	Toluene	ND	0.50	ND	0.13	
591-78-6	2-Hexanone	ND	0.50	ND	0.12	
124-48-1	Dibromochloromethane	ND	0.50	ND	0.059	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
123-86-4	n-Butyl Acetate	ND	0.50	ND	0.11	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: Webster Environmental Associates
Client Sample ID: Method Blank
Client Project ID: Sunnyvale

ALS Project ID: P1304046
 ALS Sample ID: P130912-MB

Test Code: EPA TO-15 Modified
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8
 Analyst: Lusine Hakobyan
 Sample Type: 3 L Zefon Bag
 Test Notes:

Date Collected: NA
 Date Received: NA
 Date Analyzed: 9/12/13
 Volume(s) Analyzed: 1.00 Liter(s)

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.50	ND	0.11	
127-18-4	Tetrachloroethene	ND	0.50	ND	0.074	
108-90-7	Chlorobenzene	ND	0.50	ND	0.11	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
75-25-2	Bromoform	ND	0.50	ND	0.048	
100-42-5	Styrene	ND	0.50	ND	0.12	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
111-84-2	n-Nonane	ND	0.50	ND	0.095	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	ND	0.073	
98-82-8	Cumene	ND	0.50	ND	0.10	
80-56-8	alpha-Pinene	ND	0.50	ND	0.090	
103-65-1	n-Propylbenzene	ND	0.50	ND	0.10	
622-96-8	4-Ethyltoluene	ND	0.50	ND	0.10	
108-67-8	1,3,5-Trimethylbenzene	ND	0.50	ND	0.10	
95-63-6	1,2,4-Trimethylbenzene	ND	0.50	ND	0.10	
100-44-7	Benzyl Chloride	ND	0.50	ND	0.097	
541-73-1	1,3-Dichlorobenzene	ND	0.50	ND	0.083	
106-46-7	1,4-Dichlorobenzene	ND	0.50	ND	0.083	
95-50-1	1,2-Dichlorobenzene	ND	0.50	ND	0.083	
5989-27-5	d-Limonene	ND	0.50	ND	0.090	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.50	ND	0.052	
120-82-1	1,2,4-Trichlorobenzene	ND	0.50	ND	0.067	
91-20-3	Naphthalene	ND	0.50	ND	0.095	
87-68-3	Hexachlorobutadiene	ND	0.50	ND	0.047	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

Client: Webster Environmental Associates
Client Project ID: Sunnyvale

ALS Project ID: P1304046

Test Code: EPA TO-15 Modified
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8
 Analyst: Lusine Hakobyan
 Sample Type: 3 L Zefon Bag(s)
 Test Notes:

Date(s) Collected: 9/11/13
 Date(s) Received: 9/12/13
 Date(s) Analyzed: 9/12/13

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4	Toluene-d8	Bromofluorobenzene	Acceptance Limits	Data Qualifier
		Percent Recovered	Percent Recovered	Percent Recovered		
Method Blank	P130912-MB	102	104	97	70-130	
Sludge Bed Surface	P1304046-001	101	101	101	70-130	
Fan on Roof of Primary	P1304046-002	100	102	103	70-130	
DAF Effluent Weir	P1304046-003	101	103	101	70-130	
Fixed Growth Reactor #3	P1304046-004	100	103	102	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.