

## Update to Neighborhood for Science Exhaust System 011419

Phoenix College continues move forward with the implementation of noise reduction and visual screening for the Science Building exhaust system.

Over the Holiday Break, the contractor performed structural exploratory work on the roof deck to determine the most effective placement of the supports needed for the screen wall. This project went well and that data will allow the architect and contractor to quickly finalize the design and schedule for the screen wall. The College plans to issue a formal construction schedule to the community toward the end of January 2019.

A number of community members met with the College and District, and requested that the college to look into additional sound abatement equipment beyond the proposed screen wall, specifically inline sound attenuators supplied by the fan manufacturer, Greenheck.

In conjunction with the fan manufacturer and the project architect, our acoustical consultant McKay/Conant/Hoover has completed a comprehensive analysis on the design and material selection for the screen wall and other methods of noise abatement including the inline attenuators.

In summary, the attenuator options will change the overall sound level about 1 to 2 decibels. They are effective only within certain frequency bands. In general, the wind-wrap attenuator provides more attenuation at low frequencies, while the wind-band attenuator provides more attenuation at mid frequencies. The combined effect of both these devices does achieve the lowest predicted noise levels in all frequency bands, but because the sound reduction values of each attenuator are small, the combined overall effect is modest and the benefit will be around a “just noticeable” difference. Based on this data, we caution that the amount of added benefit may be minimal.

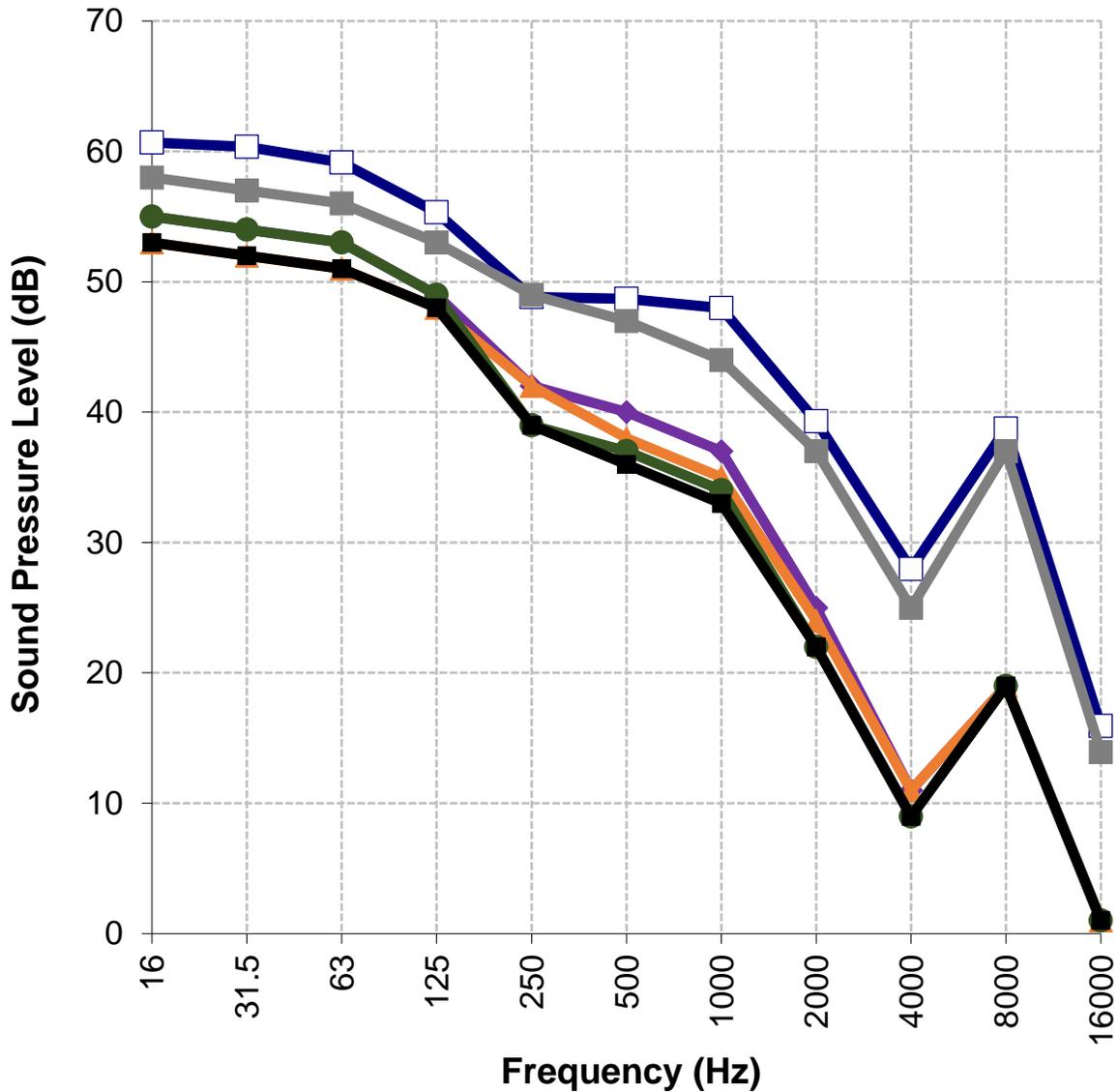
Attached is a graph covering all the options for lowering the fan noise without adding stack height, including the in-line attenuator devices. The graph plots the predicted noise levels with the wind-wrap attenuator, wind-band attenuator, the proposed barrier, and the combination of all those elements for an overall predicted sound level of 39 decibels (black line, option I) vs. a predicted value (purple line, Option C) of about 41 decibels without the addition of the attenuators. The 10 decibel reduction from the current level (51 decibels) represents a perceived 50% reduction in noise level (decibel measurement is exponential, not linear).

Another issue that was raised by the community was a concern over potential environmental hazards being introduced into the neighborhoods from the exhaust emissions from the building. The college hired Dominion Environmental Consultants to perform testing on the emissions and provide opinions on hazards. Following a

presentation to the community at last November's meeting, neighbors requested actual field tests to verify the effectiveness and safety of the lab exhaust system.

To conduct the test, Dominion placed measuring sensors at five homes in the community adjacent to the science building to ascertain every day, ambient chemical levels present in the air to establish a background level. Once those values were recorded, high concentrations of toluene and ethanol (approximately 50 times the amount that would typically be used for lab experiments) were placed in the lab fume hoods, boiled into vapor, and released into the atmosphere via the exhaust system to determine the amounts detected at the five measuring locations. These chemicals were selected because they both are commonly used in the science labs, are easy to convert into vapor to be exhausted, are heavier than air so that they will settle toward the ground after being exhausted and can be measured, and have nationally established occupational exposure limit for safety.

In summary, both chemicals detected in the neighborhood during the testing period were far less than the safety limit for these substances and negligible, below nationally established minimal risk levels. In the opinion of the consultant, the laboratory equipment in and on the building works as designed by diluting the emissions and poses no threat to the surrounding community, students and staff. Detailed testing procedures and outcomes can be found in the attached documentation. The Conclusions section on Page 3 is the best summary of the test and results in non-technical language.



- a) Current Daytime Fan Condition (measured) (51dBA)
- b) Predicted Levels with Windwrap Attenuator to each fan (48dBA)
- c) Predicted Levels with Proposed Barrier (41dBA)
- g) Predicted Levels with Windwrap Attenuator to each fan plus proposed barrier (40dBA)
- h) Predicted Levels with Windband Attenuator to each fan plus proposed barrier (39dBA)
- i) Predicted Levels with Windwrap Attenuator plus Windband Attenuator to each fan plus proposed barrier (39dBA)



DOMINION

November 14, 2018

Mr. Douglas McCarthy  
Director, Facilities Planning and Development  
Phoenix College  
1202 W. Thomas Rd.  
Phoenix, AZ 85013

RE: Phoenix College Air Monitoring

Dear Mr. McCarthy,

Pursuant to your request, Dominion Environmental Consultants, Inc. (Dominion) conducted an air monitoring experiment to gather analytical data to establish the potential potency of any chemicals that may be released in the air from inside the laboratory facility along with the possible effect that those airborne chemicals may have on the community surrounding the science building at Phoenix College.

### **EXPERIMENTAL DESIGN**

#### **Chemical Selection**

Dominion was provided a list of chemicals currently being used for chemistry lab classes at Phoenix College. From that list of chemicals, Dominion selected Ethyl Alcohol (Ethanol) and Toluene as the target chemicals for the testing episode. Ethanol was used because it is commonly used in lab experiments, can be easily converted into a vapor that would be expelled through the hood, is slightly denser than air, and is available in large quantities. Ethanol also has an established occupational exposure limit that can be used to evaluate the analytical data. Toluene was selected since it can also be easily converted to a vapor, is much denser than air and was available in sufficient quantities to conduct the experiment. It is also considered to be one of the more toxic chemicals used in laboratory experiments at Phoenix College. Toluene also has an established occupational exposure limit as well as population exposure limits, both of which can be used to evaluate the analytical data.

Chemicals that are denser than air would be expected to settle out of the air toward the ground once expelled from the chemical hood exhausts.

To assure the purity of the chemicals used during the experiment, a liquid solution of 95% Ethanol and 100% Toluene was provided to Dominion in sufficient quantities by Phoenix College laboratory staff members to conduct this experiment.

## **Air Monitoring Methodology**

Monitoring for Toluene and Ethanol was conducted using Assay 525 Monitor badges. Each badge is opened up to allow for contact to the air. As the Toluene and Ethanol diffuses into the badge, the molecules adsorb onto the collection media inside the badge and are retained until the badge arrives at the laboratory. The rate of diffusion is 83.4 mL/min into the badge for Ethanol and 69.5 ml/min for Toluene. At the end of the sampling period, the badge is capped to prevent additional diffusion into the badge and placed in a sealed container for transport to the laboratory. Once at the laboratory, the chemicals absorbed to the sampling media are desorbed and analyzed. All assay badges were submitted to SGS Galson Laboratory in Syracuse, NY under chain of custody for analysis. Samples were analyzed for Ethanol following mod. NIOSH 1400 and for Toluene following mod. NIOSH 1501/OSHA 111.

## **Chemical Hood Set Up**

Dominion was provided access to an organic chemistry laboratory equipped with 7 chemical hoods. In each hood a hot plate was installed with two beakers. One beaker was filled with 50 milliliters (ml) of Ethanol and one beaker was filled with 50 ml of Toluene. Dominion was informed by the laboratory staff that the each beaker would contain approximately 50 times the amount of each chemical than what would be utilized in a typical laboratory class. The hot plate was turned on to boil the Ethanol and Toluene. All of the Toluene and Ethanol had been evaporated off by the end of the monitoring period.

A single assay badge was placed along the back of two of the chemical hoods. Smoke tubes were used to determine the air stream pattern in the hood around the beakers so that the badge could be accurately placed inside the airstream. The badge was deployed for a total of 65 minutes. At the time, the air flow monitors on the chemical hoods indicated flow rates were between 101-107 feet per minute.

Dominion observed that a hood certification sticker was attached to each chemical hood. The certifications were conducted by Advanced Testing and Certification (ATC) and are good until August 31, 2019.

## **Community Background Air Monitoring**

Prior to placing the Ethanol and Toluene in the chemical hoods, Dominion deployed assay badges at three locations in the surrounding community. Badges were placed at 936 West Verde Lane, 1126 West Edgemont Avenue and 1110 West Edgemont Avenue. West Verde Lane is located approximately 0.06 miles northeast of the science building and West Edgemont Avenue is located approximately 0.09 miles south of the science building. The badges were deployed from 10:39 am to 11:39 am at 936 W. Verde Ln., 10:34 am to 11:34 am at 1110 W. Edgemont Ave., and from 10:37 to 11:37 am at 1126 W. Edgemont Ln.

The wind direction and speed reported in the area at the beginning of the background monitoring was from the east at 5 miles per hour. Winds were reported to be calm by the end of the monitoring period.

## **Community Air Monitoring**

Once the chemicals were placed on the hotplates in the chemical hoods assay badges were deployed at 1110 W. Edgemont Ave, 1126 W. Edgemont Ave., 924 W. Verde Ln., 936 W. Verde Ln. and 931 W. Verde Ln. The badges were deployed as follows:

1126 W. Edgemont Ave. – 11:41 am to 12:41 pm  
1110 W. Edgemont Ave. – 11:44 am to 12:44 pm  
936 W. Verde Ln. – 11:48 am to 12:48 pm  
924 W. Verde Ln – 11:50 am to 12:50 pm  
931 W. Verde Ln – 11:51 am to 12:51 pm

The wind direction and speed reported in the area during the monitoring period was variable at 3 miles per hour.

## **RESULTS**

Monitoring badges were placed in hoods 3 and 5 in the chemistry lab. The concentration of Toluene ranged from 200 to 450 parts per million (ppm) and from 490 to 550 for Ethanol.

The background levels for the airborne chemicals released into the community during the period for when the test chemicals were deployed inside the laboratory hoods were reported by laboratory analytical results to be less than the level of analytical detection of 0.7 ppm for Ethanol and 0.3 ppm for Toluene.

## **CONCLUSIONS**

When evaluating the potential health impact to the students and staff and the surrounding neighborhood, Dominion compared the analytical data to both regulatory limits as well as minimal risk levels.

The current OSHA permissible exposure limit for Toluene is 200 ppm for an 8 hour time weighted average and 300 ppm for a 15 minute time weighted average. The analytical data indicates that concentration of Toluene detected in the hoods would have exceeded the OSHA exposure limits. When the vapors are expelled from the exhaust fans they are diluted 168 percent with fresh air. The vapor is further diluted in the outdoor air above the exhaust fans. Dominion compared the analytical data in the surrounding neighborhood to the Minimal Risk Levels (MRLs) published by the Agency for Toxic Substances and Disease Registry (ATSDR). The MRLs are health-based values to protect the health of the general population. The ATSDR states: “An MRL is an estimate of the amount of a chemical a person can eat, drink, or breathe each day without a detectable risk to health. If someone is exposed to an amount above the MRLs, it does not mean that health problems will happen.” MRLs can be made for 3 different time periods: acute – 1 to 14 days of exposure, intermediate – 15 to 364 days and chronic – exposure for more than 364 days. The current MRL for chronic inhalation of Toluene is 1ppm. According to the analytical data produced as a result of the air sampling collected in the neighborhood, the neighborhood exposure for Toluene would be well below the MRL for chronic inhalation exposure.

The current OSHA permissible exposure limit for Ethanol is 1000 ppm for an 8 hour time weighted average. There currently are no established or published short term exposure limits for Ethanol. Based on the analytical data collected in the chemical hood, the Ethanol levels would not have exceeded the established OSHA permissible exposure limit. There are also no established MRLs for Ethanol. Given the same dynamics of vapor dilution as provided above and the analytical data collected from the neighborhood, it is Dominion’s opinion that there would be no increased risk to the surrounding neighborhood, based on the data presented herein.

Furthermore, as stated earlier, the levels of chemicals used in the simulation provided above were approximately 50 times the amount that would normally be used during a typical chemistry lab experiment. Therefore, the overall risk to the community would be significantly lower than reported during this simulation experiment.

In conclusion, it is Dominion's opinion based on the data presented herein, that considering the current laboratory equipment and protocols used along with the amount and type of chemicals utilized in the laboratory at Phoenix College, it does not currently pose a health threat to the surrounding community.

Dominion recommends that a full re-evaluation be conducted if the intended use of the laboratory is changed or if any of the laboratory chemicals being utilized during this evaluation are changed or are different in potency than those evaluated during this investigation.

### **LIMITATION**

The conclusions and results contained herein are based solely on the information presented in this report. The sampling, testing, and observations described in the report represent conditions only at the specified times and locations. Additional information or contamination which were hidden, undiscovered, inaccessible, or not a part of the findings presented herein, would result in the modification of the conclusions and recommendations made herein. The sampling methods, techniques, and scope of services were not comprehensive or to be considered all inclusive. Any corrective measures are presented as a courtesy and are not to be considered a complete or detailed set of specifications. Dominion performed its investigation in a specific area, as directed by the client.

Dominion's scope of service did not include the inspection for, or identification of any other hazardous or controlled substance not specifically identified herein.

Dominion is not responsible for the accuracy of information provided by others, or for conditions or consequences arising from relevant facts that were withheld, concealed, undiscovered, incomplete, or not fully disclosed. Dominion is not a law firm and therefore, makes no representations regarding any potential liability of any person or entity for site conditions. Further, Dominion is not qualified to present medical advice. If any present or future health issues are in question, it is recommended that the findings in this report be presented to a qualified medical professional for evaluation.

If you should have any questions or would like to discuss the contents of this report, please do not hesitate to contact Dominion at any time.

Sincerely,

Dominion Environmental Consultants, Inc.



Dr. Ryan Kuhn, Ph.D., CIH  
Corporate Director of Industrial Hygiene Services



# **EXHIBIT 1**



GALSON

Mr. Ryan Kuhn  
Dominion Environmental Consultants  
20045 North 19th Avenue  
Building 7  
Phoenix, AZ 85027

November 13, 2018

DOH ELAP #11626  
AIHA-LAP #100324

Account# 21261

Login# L462056

Dear Mr. Kuhn:

Enclosed are the analytical results for the samples received by our laboratory on November 06, 2018. All test results meet the quality control requirements of AIHA-LAP and NELAC unless otherwise stated in this report. All samples on the chain of custody were received in good condition unless otherwise noted.

Results in this report are based on the sampling data provided by the client and refer only to the samples as they were received at the laboratory. When possible, non-IOM samples will be retained for 14 days following the date of this report (unless an extension is specifically requested). IOM samples are retained for 7 days.

Current Scopes of Accreditation can be viewed at [www.sgsgalson.com](http://www.sgsgalson.com) in the accreditations section of the "About" page.

Please contact Nicole Tormey at (888) 432-5227, if you would like any additional information regarding this report. Thank you for using SGS Galson.

Sincerely,

SGS Galson

Lisa Swab  
Laboratory Director

Enclosure(s)



**GALSON**

LABORATORY ANALYSIS REPORT

6601 Kirkville Road  
East Syracuse, NY 13057  
(315) 432-5227  
FAX: (315) 437-0571  
www.sgsgalson.com

Client : Dominion Environmental Consult Account No.: 21261  
Site : Phoenix College Login No. : L462056  
Project No. : AZ1419.76  
Date Sampled : 02-NOV-18 Date Analyzed : 08-NOV-18  
Date Received : 06-NOV-18 Report ID : 1101520

**Ethyl Alcohol**

Sample ID	Lab ID	Time minutes	Raw ug	Total ug	Conc mg/m3	ppm
936 W VERDE BACKGRND	L462056-1	60	<5	<7	<1	<0.7
1126 W EDGEMONT BKGD	L462056-2	60	<5	<7	<1	<0.7
1110 W EDGEMONT BKGD	L462056-3	60	<5	<7	<1	<0.7
1110 W. EDGEMONT	L462056-4	60	<5	<7	<1	<0.7
1126 W. EDGEMONT	L462056-5	60	<5	<7	<1	<0.7
924 W. VERDE	L462056-6	60	<5	<7	<1	<0.7
936 W. VERDE	L462056-7	60	<5	<7	<1	<0.7
931 W. VERDE	L462056-8	60	<5	<7	<1	<0.7
HOOD 3	L462056-9	65	4100	5600	1000	550
HOOD 5	L462056-10	65	3600	5000	920	490
BLANK	L462056-11	NA	<5	<7	NA	NA

**COMMENTS:** Please see attached lab footnote report for any applicable footnotes.

Level of quantitation: 5 ug	Submitted by: ARE	Approved by: MLN
Analytical Method : mod. NIOSH 1400; GC/FID BADGE	Date : 13-NOV-18	NYS DOH # : 11626
Collection Media : Assay 525	Supervisor : KAG	QC by : MLN

< -Less Than	mg -Milligrams	m3 -Cubic Meters	kg -Kilograms	NA -Not Applicable	ND -Not Detected
> -Greater Than	ug -Micrograms	l -Liters	NS -Not Specified	ppm -Parts per Million	



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Project No. : AZ1419.76
Date Sampled : 02-NOV-18 Date Analyzed : 08-NOV-18
Date Received : 06-NOV-18 Report ID : 1101521

Toluene

Table with 7 columns: Sample ID, Lab ID, Time (minutes), Raw (ug), Total (ug), Conc (mg/m3), ppm. Rows include various sample types like VERDE BACKGRND, EDGEMONT BKGD, VERDE, HOOD, and BLANK.

COMMENTS: Please see attached lab footnote report for any applicable footnotes.

Level of quantitation: 5 ug Submitted by: ARE Approved by: MLN
Analytical Method : mod. NIOSH 1501/OSHA 111; GC/FID BADGE Date : 13-NOV-18 NYS DOH # : 11626
Collection Media : Assay 525 Supervisor : KAG QC by : MLN

< -Less Than mg -Milligrams m3 -Cubic Meters kg -Kilograms NA -Not Applicable ND -Not Detected
> -Greater Than ug -Micrograms l -Liters NS -Not Specified ppm -Parts per Million



# GALSON

## LABORATORY FOOTNOTE REPORT

6601 Kirkville Road  
 East Syracuse, NY 13057  
 (315) 432-5227  
 FAX: (315) 437-0571  
 www.sgsgalson.com

Client Name : Dominion Environmental Consultants  
 Site : Phoenix College  
 Project No. : AZ1419.76

Date Sampled : 02-NOV-18 Account No.: 21261  
 Date Received: 06-NOV-18 Login No. : L462056  
 Date Analyzed: 08-NOV-18

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Unless otherwise noted below, all quality control results associated with the samples were within established control limits or did not impact reported results.

Note: The findings recorded within this report were drawn from analysis of the sample(s) provided to the laboratory by the Client (or a third party acting at the Client's direction). The laboratory does not have control over the sampling process, including but not limited to the use of field equipment and collection media, as well as the sampling duration, collection volume or any other collection parameter used by the Client. The findings herein constitute no warranty of the sample's representativeness of any sampled environment, and strictly relate to the samples as they were presented to the laboratory. For recommended sampling collection parameters, please refer to the Sampling and Analysis Guide at [www.sgsgalson.com](http://www.sgsgalson.com)

Unrounded results are carried through the calculations that yield the final result and the final result is rounded to the number of significant figures appropriate to the accuracy of the analytical method. Please note that results appearing in the columns preceding the final result column may have been rounded and therefore, if carried through the calculations, may not yield an identical final result to the one reported.

The stated LOQs for each analyte represent the demonstrated LOQ concentrations prior to correction for desorption efficiency (if applicable).

Unless otherwise noted below, reported results have not been blank corrected for any field blank or method blank.

L462056 (Report ID: 1101520):

Total ug corrected for a desorption efficiency of 73%.  
 SOPs: GC-SOP-16(19), GC-SOP-12(15), GC-SOP-9(19)  
 Results calculated with a desorption efficiency (DE) that is less than 75% are considered to be semi-quantitative.

<	-Less Than	mg	-Milligrams	m3	-Cubic Meters	kg	-Kilograms	ppm	-Parts per Million		
>	-Greater Than	ug	-Micrograms	l	-Liters	NS	-Not Specified	ND	-Not Detected	NA	-Not Applicable



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LABORATORY FOOTNOTE REPORT

6601 Kirkville Road  
East Syracuse, NY 13057  
(315) 432-5227  
FAX: (315) 437-0571  
www.sggalson.com

Client Name : Dominion Environmental Consultants  
Site : Phoenix College  
Project No. : A21419.76

Date Sampled : 02-NOV-18 Account No.: 21261  
Date Received: 06-NOV-18 Login No. : L462056  
Date Analyzed: 08-NOV-18

L462056 (Report ID: 1101520):

Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2). The estimated accuracy applies to the media, technology, and SOP referenced in this report and does not account for the uncertainty associated with the sampling process. The accuracy is based solely on spike recovery data from internal quality control samples. Where N/A appears below, insufficient data is available to provide statistical accuracy and mean recovery values for the associated analyte.

Parameter	Accuracy	Mean Recovery
Ethyl Alcohol	N/A	N/A

L462056 (Report ID: 1101521):

Total ug corrected for a desorption efficiency of 98%.  
SOPs: GC-SOP-16(19), GC-SOP-12(15), GC-SOP-9(19)

L462056 (Report ID: 1101521):

Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2). The estimated accuracy applies to the media, technology, and SOP referenced in this report and does not account for the uncertainty associated with the sampling process. The accuracy is based solely on spike recovery data from internal quality control samples. Where N/A appears below, insufficient data is available to provide statistical accuracy and mean recovery values for the associated analyte.

Parameter	Accuracy	Mean Recovery
Toluene	+/-6.6%	97.2%

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< -Less Than      mg -Milligrams      m3 -Cubic Meters      kg -Kilograms      ppm -Parts per Million  
> -Greater Than    ug -Micrograms      l -Liters            NS -Not Specified    ND -Not Detected      NA -Not Applicable

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773645467865  
 Date: 11/06/18  
 Shipper: FEDEX  
 Initials: JFK



Prep: UNKNOWN

1462056

# GALSON CHAIN OF CUSTODY

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You may edit and complete this COC electronically by logging in to your Client Portal account at <https://portal.galsonlabs.com/>

<input checked="" type="checkbox"/> Standard 0% <input type="checkbox"/> 4 Business Days 35% <input type="checkbox"/> 3 Business Days 50% <input type="checkbox"/> 2 Business Days 75% <input type="checkbox"/> Next Day by 6pm 100% <input type="checkbox"/> Next Day by Noon 150% <input type="checkbox"/> Same Day 200%	Client Acct No.: 21261 Report To: Mr. Ryan Kuhn Company Name: Dominion Environmental Consultants Address 1: 20045 North 19th Avenue Address 2: Building 7 City, State Zip: Phoenix, AZ 85027 Phone No.: 623 - 516 - 1415 Cell No.: Email reports to: rkuhn@dominion-env.com Comments: Online COC No.: 166313	Invoice To: Ms. Carolyn Crow Company Name: Dominion Environmental Consultants Address 1: 20045 North 19th Avenue Address 2: Building 7 City, State Zip: Phoenix, AZ 85027 Phone No.: 623 - 516 - 1415 Email Address: admin@dominion-env.com P.O. No.: 228230 Payment info: <input type="checkbox"/> I will call SGS Galson to provide credit card info <input type="checkbox"/> Card on File (enter the last five digits on the line below)
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CS Rep: NTORMEY

Samples submitted using the FreePumpLoan™ Program  
 Samples submitted using the FreeSamplingBadges™ Program

Comments: \_\_\_\_\_ State Sampled: \_\_\_\_\_

Please indicate which OEL(s) this data will be used for:  
 OSHA PEL  ACGIH TLV  MSHA  Cal OSHA  
 IAQ: Specify Limit(s)  Other: Specify Other

Site Name: Phoenix College Project: Phoenix College AZ 1419 Z6 Sampled By: R. Kuhn

List description of industry or Process/interferences present in sampling area: \_\_\_\_\_

Sample ID * (Maximum of 20 Characters)	Date Sampled *	Collection Medium	Sample Volume Sample Time Sample Area *	Liters Minutes in <sup>3</sup> , cm <sup>3</sup> , ft <sup>3</sup> *	Analysis Requested	Method Reference ^	Hexavalent Chromium Process (e.g., welding, plating, painting, etc.)
936 W Verde Background	11-2-18	Assay N525 Organic Vapor Monitor		60 min	Toluene + Ethanol	mod. NIOSH 1501/OSHA 111; GC/FID BADGE	
9126 W Edgemont Background	↓	Assay N525 Organic Vapor Monitor		↓	Toluene + Ethanol	mod. NIOSH 1501/OSHA 111; GC/FID BADGE	

^ If the method(s) indicated on the COC are not our routine/preferred method(s), we will substitute our routine/preferred methods. If this is not acceptable, check here to have us contact you.

Chain of Custody	Print Name / Signature	Date	Time	Print Name / Signature	Date	Time
Relinquished By:	Ryan Kuhn	11-2-18	3:00p	Received By: Jolene Fish	11/6/18	9:18
Relinquished By:				Received By:		

\* You must fill in these columns for any samples which you are submitting.  
 Samples received after 3pm will be considered as next day's business.

Online COC No.: 166313  
 Prep No.: PCA501766  
 Account No.: 21261  
 Draft: 10/19/2018 12:45:50 PM

All services are rendered in accordance with the applicable SGS General Conditions of Service accessible via: <http://www.sgs.com/en/Forms-and-Conditions.aspx>

