



May 22, 2023

Mr. Brian Croyle, Environmental Specialist
Montgomery County Public Schools
Division of Sustainability and Compliance
8301 Turkey Thicket Drive
Gaithersburg, MD 20879

Ref: **Sampling for Asphalt Fumes and Hydrogen Sulfide Gas – 5.5.23**
Poolesville High School
KCI Job No. 122302497

KCI Technologies Inc. (KCI) is submitting the following letter report detailing the findings of air sampling of Asphalt Fumes (benzene soluble fraction) and Hydrogen Sulfide gas at Poolesville High School located at 17501 W. Willard Rd. Poolesville, MD 20837 (subject site). Baseline sampling was conducted by KCI's Industrial Hygienist, Ms. Brittany Maas, under the oversight of KCI's Certified Industrial Hygienist (CIH), Mr. Jonathan Coale.

Background:

At Poolesville High School, current renovations and construction has raised concerns from student parents. Students and faculty have voiced concerns related to an odor present in the school while the roofing work is occurring. The parents are concerned the students are being exposed to unsafe conditions related to the asphalt fumes being produced during the roofing installation. MCPS contacted KCI to assist them in collecting data on the school's occupants' potential exposure to fumes related to the roofing work being conducted.

Description of the Work Performed:

On May 5, 2023, KCI conducted air sampling for Asphalt Fumes (benzene soluble fraction) and Hydrogen Sulfide gas levels at Poolesville High School. The sampling of Asphalt Fumes (benzene soluble fraction) was done under method: Modified NIOSH 5042. This method will determine the total concentration of total particulate and the soluble fraction to which an individual is exposed. NIOSH has an adopted value of 5 mg/m³ Threshold Limit Value (TLV) -Time-Weighted Average (TWA) for asphalt fumes. NIOSH's definition of TLV-TWA is the "concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, for a working lifetime without adverse effect". KCI also utilized a multi-gas meter to collect real time readings of hydrogen sulfide (H₂S), carbon monoxide (CO), and oxygen (O₂) levels in various locations throughout the building and exterior. Direct read data was performed to collect short term "grab" samples to determine if the gas was present and was not intended to collect exposure data.

During the time of the air sampling, construction was being conducted, there was no asphalt smell noted outside of the building. KCI placed six (6) sampling pumps set to approximately 1 liter per minute in locations pre-determined by MCPS. It is KCI's understanding that the sample locations selected by MCPS were where complaints were made from students. After all sampling pumps were placed, KCI took real time readings of the hydrogen sulfide levels at each of these locations every 30 minutes inside and

every 30 minutes outside. A sampling location map can be found in attachment A.

KCI conducted the screening from approximately 07:45 until 14:30. Conditions during the sampling period were clear skies and 37°F - 44°F. Winds were between 0 and 9mph with gusts up to 17mph from NW, WNW, and NNW.

While on site, KCI conducted follow up sampling of dust particulate using a DustTrax DRX aerosol monitor. An aerosol monitor measures particulate aerosol contaminants such as dust, smoke, fumes, and mists. Previously on April 24, 2023, KCI spot checked areas around the construction site and main school buildings during roofing and construction activities to get baseline readings of aerosol contaminants created during the activities. KCI followed up and placed the aerosol monitor at the location with the highest levels of contaminants—Between Science/Technology Building and Main Building—in order to collect additional data and determine any hazards that may be present.

After sampling, the cassettes were sealed, logged, bagged, and shipped as required to Galson Laboratories in East Syracuse, NY, where they were analyzed for Asphalt Fume (benzene soluble fraction) Modified NIOSH Method 5042. Galson Laboratories is accredited by the American Industrial Hygiene Association (#100324).

Results:

Asphalt Fumes (Benzene Soluble Fraction)

| Location | Sample Number | Concentration (mg/m³) | Above TLV-TWA? |
|---|----------------------|---|-----------------------|
| Arts Hallway – Outside Room 44 | PHS – 01D | <0.28 | No |
| Auditorium Lobby | PHS – 02D | <0.28 | No |
| Science Building 1 st Floor – Outside Room 184 | PHS – 03D | <0.28 | No |
| Science Building 2 nd Floor – Outside Room 284 | PHS – 04D | <0.28 | No |
| Outside Gym Entrance (exterior) | PHS – 05D | <0.28 | No |
| West End of Portables (exterior) | PHS – 06D | <0.28 | No |
| Field Blank | PHS – 07D | N/A | N/A |
| Lab Blank | PHS – 08D | N/A | N/A |

N/A: Not Applicable

Laboratory analysis results are included as Attachment B.

Gas Meter Readings

| Time | Oxygen (O₂) | Carbon Monoxide (CO) | Hydrogen Sulfide (H₂S) |
|-------------|-------------------------------|-----------------------------|--|
| 0745 - 0815 | 20.8 | 0 | 0 |
| 0915 – 0945 | 20.8 | 0 | 0 |
| 1045– 1115 | 20.8 | 0 | 0 |
| 1230 – 1300 | 20.8 | 0 | 0 |
| 1345 – 1430 | 20.8 | 0 | 0 |

Olfactory Findings

During walkthroughs, KCI noted the following asphalt smells:

| Table 3 – Olfactory Investigation Summary | | | |
|--|------------------|---------------------|-------------------|
| Location | Findings | | |
| | Morning | Mid-Day | End of Day |
| Exterior Outside New Main Office | No Asphalt Smell | No Asphalt Smell | No Asphalt Smell |
| Exterior Between Main Building & Science/Tech Addition | No Asphalt Smell | No Asphalt Smell | No Asphalt Smell |
| Exterior By Portables | No Asphalt Smell | No Asphalt Smell | No Asphalt Smell |
| Main Lobby | No Asphalt Smell | No Asphalt Smell | No Asphalt Smell |
| Art Hallway | No Asphalt Smell | No Asphalt Smell | No Asphalt Smell |
| Auditorium Corridor | No Asphalt Smell | No Asphalt Smell | No Asphalt Smell |
| Gym Hallway | No Asphalt Smell | No Asphalt Smell | No Asphalt Smell |
| Science and Technology Addition | No Asphalt Smell | No Asphalt Smell | No Asphalt Smell |
| Student Parking Lot | No Asphalt Smell | Light Asphalt Smell | No Asphalt Smell |

DustTrax DRX Aerosol Monitor Readings

| Table 4 – DustTrax Reading Summary | | |
|---|-------------------------|------------------------------|
| Parameter | Average Reading* | Reading Range* |
| Total Suspended Particulates (Dust) | 0.10 mg/m ³ | 0.0 – 3.55 mg/m ³ |
| *Average and range were determined from 3-second intervals. | | |

Field data sheet can be found in Attachment C.

KCI included a chart summarizing the DustTrax data collected during field survey on May 5, 2023. Data points were collected every three (3) seconds from 0800 to 1315. Due to the large size of data points, KCI averaged the data into one (1) minute averages. This data is represented in the graph found in Attachment D.

Conclusion:

In conclusion, the baseline sampling data determined airborne Asphalt Fumes concentrations were below the NIOSH TLV-TWA adopted value during the period of sampling. In addition, H₂S and CO concentrations were not present or at concentrations below the gas meters detectable range. Oxygen levels were at the expected levels.

OSHA has recommendations for particulates not otherwise regulated, total and respirable dust, which are

Mr. Brian Croyle

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dusts generated from solid substances, nuisance, and inert dusts. OSHA's PEL for 8-hour time weighted average (TWA) of particulates not otherwise regulated is 5 mg/m^3 . Concentrations for particulates not otherwise regulated were below OSHA's PEL of 5 mg/m^3 .

During sampling, asphalt roofing activities were being performed.

If you have questions or comments regarding this report, please contact me.

Sincerely,
KCI Technologies, Inc

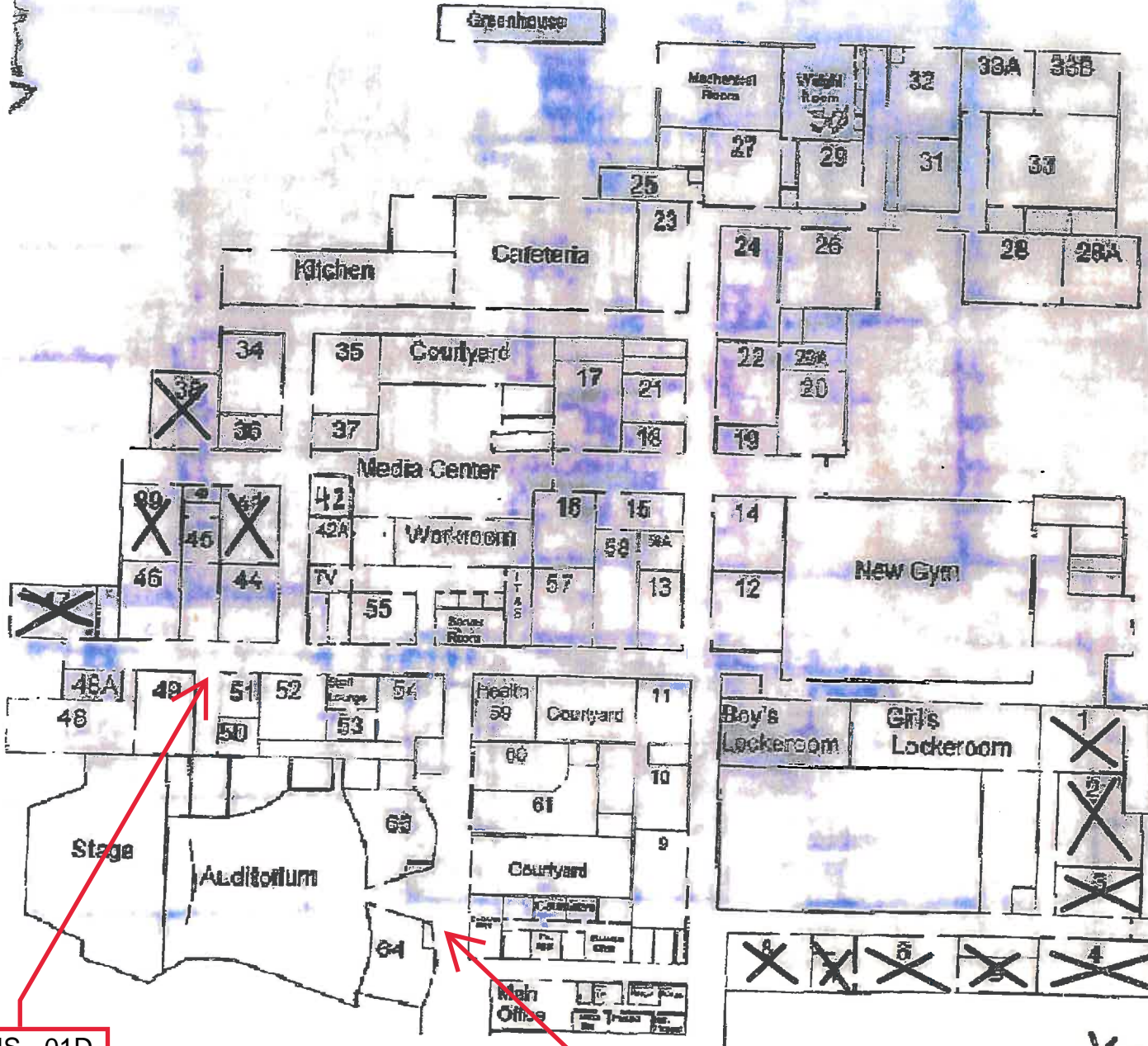


Tyler McCleaf, CSP, RMP
Certified Safety Professional
KCI Technologies, Inc.

Attachment A: Sample Locations
Attachment B: Laboratory Certificate of Analysis Report for Air Samples
Attachment C: DustTrax Readings Data Summary Sheets
Attachment D: Dust Monitoring Results Summary Chart

Attachment A
Field Notes

View



| | |
|-----------|-----|
| P1 | P6 |
| P2 | P7 |
| P3 | P8 |
| P4 | P9 |
| P5 | P10 |
| Portables | |

PHS - 01D

PHS - 02D

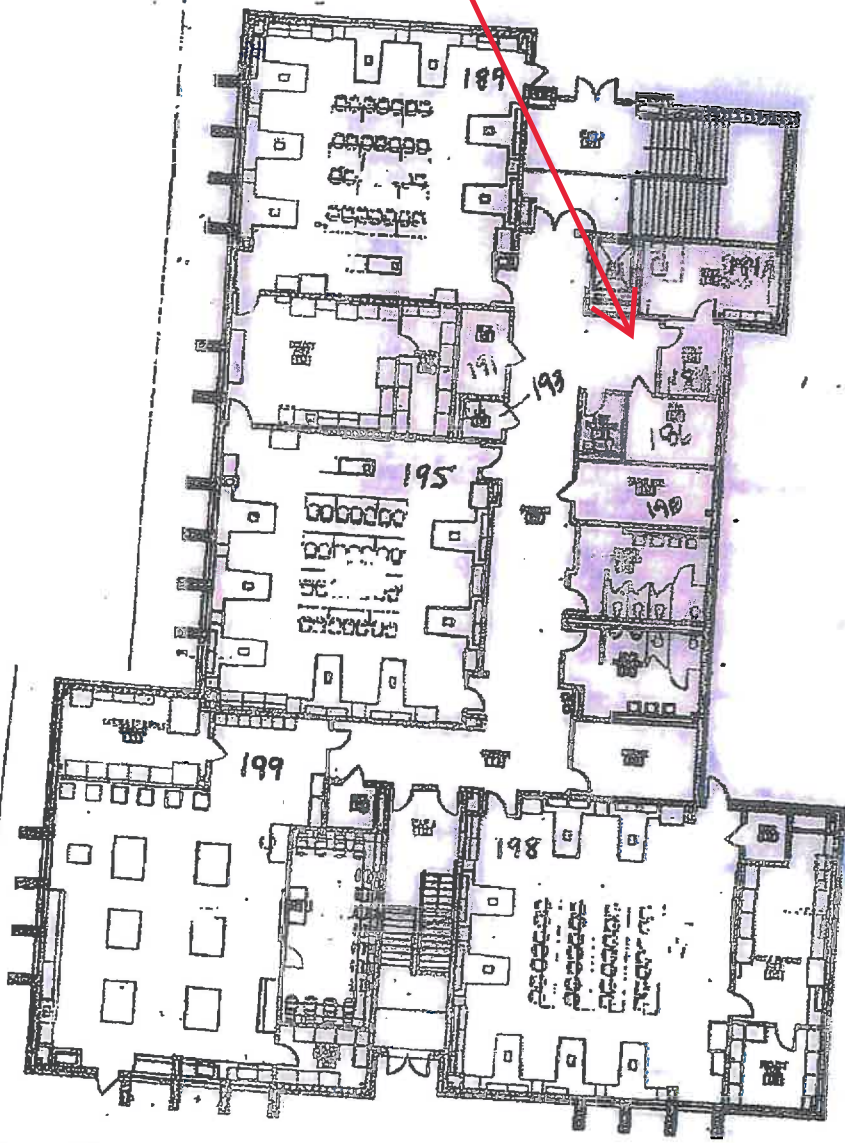
PHS - 06D (exterior)

PHS - 05D (exterior)

X = Room not being used

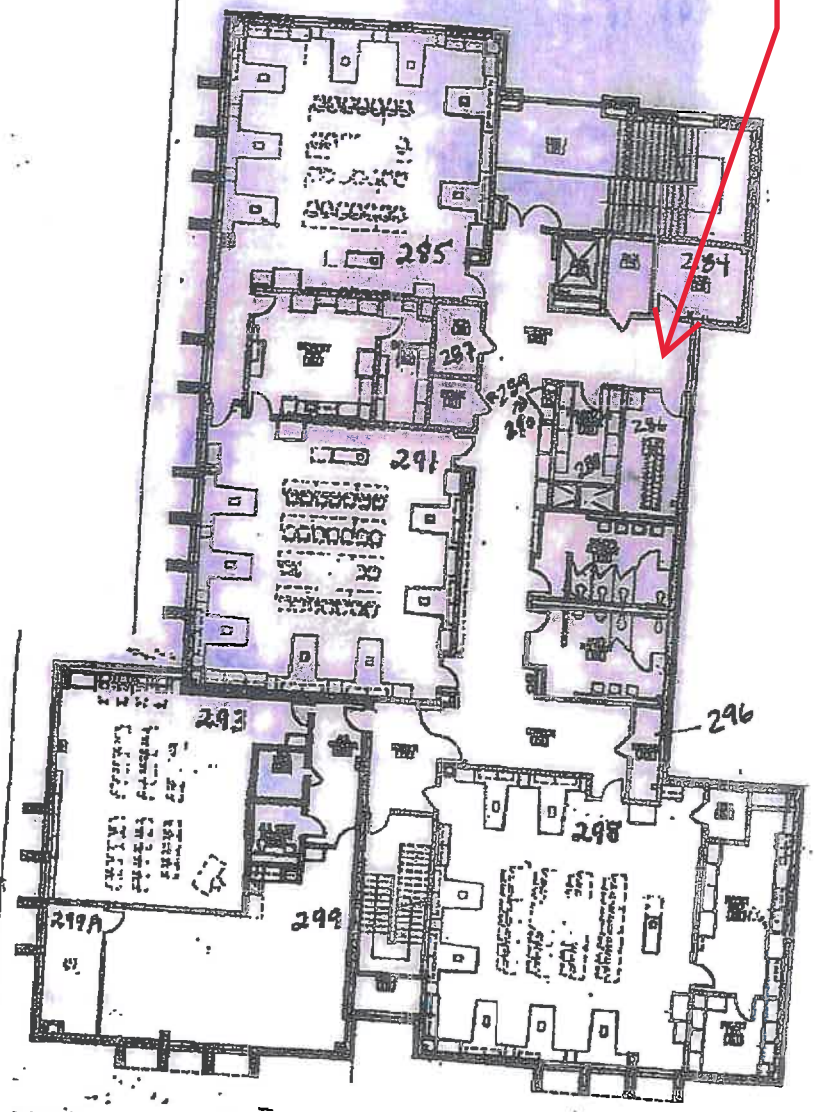
PHS - 03D

PHS - 04D



POOLESVILLE HIGH SCHOOL
Science/Technology Addition

FIRST FLOOR



POOLESVILLE HIGH SCHOOL
Science/Technology Addition

SECOND FLOOR

Attachment B
Laboratory Certificate of Analysis Report for Air Samples



GALSON

**Jon Coale
KCI Technologies
936 Ridgebrook Road
Sparks Glencoe, MD 21152**

May 11, 2023

Account# 17844

Login# L593486

Dear Jon Coale:

Enclosed are the analytical results for the samples received by our laboratory on May 08, 2023. All samples on the chain of custody were received in good condition unless otherwise noted. Any additional observations will be noted on the chain of custody.

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

Sincerely,

SGS Galson

A handwritten signature in black ink that reads 'Lisa Swab'.

**Lisa Swab
Laboratory Director**

Enclosure(s)



Terms and Conditions & General Disclaimers

- This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.
- Any holder of this document is advised that information contained herein reflects the Company’s findings at the time of its intervention only and within the limits of Client’s instructions, if any. The Company’s sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Analytical Disclaimers

- Unless otherwise noted within the report, 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.
- 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 within the report, results have not been blank corrected for any field blank or method blank data.

Accreditations SGS Galson holds a variety of accreditations and recognitions. Our quality management system conforms with the requirements of ISO/IEC 17025. Where applicable, samples may also be analyzed in accordance with the requirements of ELAP, NELAC, or LELAP under one of the state accrediting bodies listed below. Current Scopes of Accreditation can be viewed at <http://www.sgsgalson.com> in the accreditations section of the "About" page. To determine if the analyte tested falls under our scope of accreditation, please visit our website or call Client Services at (888) 432-5227.

| National/International | Accreditation/Recognition | Lab ID# | Program/Sector |
|-------------------------------------|-------------------------------|---------------|--|
| AIHA-LAP, LLC - IHLAP, ELLAP, EMLAP | ISO/IEC 17025 and USEPA NLLAP | Lab ID 100324 | Industrial Hygiene, Environmental Lead, Environmental Microbiology |

| State | Accreditation/Recognition | Lab ID# | Program/Sector |
|-------------------|---------------------------|---------------|---|
| New York (NYSDOH) | ELAP and NELAC (TNI) | Lab ID: 11626 | Air Analysis, Solid and Hazardous Waste |
| Louisiana (LDEQ) | LELAP | Lab ID: 04083 | Air Analysis, Solid Chemical Materials |

Legend

| | | | |
|-----------------------------|--------------------------|------------------------------|-------------------------|
| < - Less than | mg - Milligrams | MDL - Method Detection Limit | ppb - Parts per Billion |
| > - Greater than | ug - Micrograms | NA - Not Applicable | ppm - Parts per Million |
| l - Liters | m3 - Cubic Meters | NS - Not Specified | ppbv - ppb Volume |
| LOQ - Limit of Quantitation | kg - Kilograms | ND - Not Detected | ppmv - ppm Volume |
| ft2 - Square Feet | cm2 - Square Centimeters | in2 - Square Inches | ng - Nanograms |



GALSON

LABORATORY ANALYSIS REPORT

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

Client : KCI Technologies
Site : POOLESVILLE HIGH SCHOOL
Project No. : POOLESVILLE HS
Date Sampled : 05-MAY-23
Date Received : 08-MAY-23

Account No.: 17844
Login No. : L593486
Date Analyzed : 11-MAY-23
Report ID : 1357584

Asphalt Fumes (Benzene-Soluble Fraction)

| <u>Sample ID</u> | <u>Lab ID</u> | <u>Air Vol</u> <u>liter</u> | <u>Total</u> <u>mg</u> | <u>Conc</u> <u>mg/m3</u> |
|------------------|---------------|--------------------------------|---------------------------|-----------------------------|
| PHS-01D | L593486-1 | 360 | <0.10 | <0.28 |
| PHS-02D | L593486-2 | 360 | <0.10 | <0.28 |
| PHS-03D | L593486-3 | 360 | <0.10 | <0.28 |
| PHS-04D | L593486-4 | 360 | <0.10 | <0.28 |
| PHS-05D | L593486-5 | 360 | <0.10 | <0.28 |
| PHS-06D | L593486-6 | 360 | <0.10 | <0.28 |
| PHS-07D | L593486-7 | NA | <0.10 | NA |
| PHS-08D | L593486-8 | NA | <0.10 | NA |

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

Level of Quantitation: 0.10 mg
Analytical Method : mod. NIOSH 5042; Gravimetric
Collection Media : PTFE PW 1u 37mm

Submitted by: KGB
Date : 11-MAY-23
Supervisor : JGC

Approved by: JGC



GALSON

LABORATORY FOOTNOTE REPORT

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

Client Name : KCI Technologies
Site : POOLESVILLE HIGH SCHOOL
Project No. : POOLESVILLE HS

Date Sampled : 05-MAY-23
Date Received: 08-MAY-23
Date Analyzed: 11-MAY-23

Account No.: 17844
Login No. : L593486

L593486 (Report ID: 1357584):

SOPs: ic-asphalt(26)
BSF = Benzene Soluble Fraction

L593486 (Report ID: 1357584):

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.

| <u>Parameter</u> | <u>Accuracy</u> | <u>Mean Recovery</u> |
|--|-----------------|----------------------|
| Asphalt Fumes (Benzene-Soluble Fraction) | +/-15.7% | 93% |

772047366064
 Date: 05/08/23
 Shipper: FEDEX
 Initials: AMF
 Prep: UNKNOWN

1593486

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GALSON

CHAIN OF CUSTODY

| | | | |
|---|--|---|--|
| Turn Around Time (TAT): <input checked="" type="checkbox"/> Standard <input type="checkbox"/> 4 Business Days <input type="checkbox"/> 3 Business Days <input type="checkbox"/> 2 Business Days <input type="checkbox"/> Next Day by 6pm <input type="checkbox"/> Next Day by Noon <input type="checkbox"/> Same Day | (surcharge) 0% 35% 50% 75% 100% 150% 200% | You may edit and complete this COC electronically by logging in to your Client Portal account at https://portal.galsonlabs.com/ | |
| <input type="checkbox"/> Samples submitted using the FreePumpLoan™ Program <input type="checkbox"/> Samples submitted using the FreeSamplingBadges™ Program | | Client Acct No.: 17844 Original Prep No.: PSY695655 CS Rep: TLANCASTER Online COC No.: 271101 | Report To: Jon Coale Company Name: KCI Technologies Address 1: 936 Ridgebrook Road Address 2: City, State Zip: Sparks Glencoe, MD 21152 Phone No.: 410 - 891 - 1810 Cell No.: Email reports to: Jonathan.Coale@kci.com Email EDD to: Jonathan.Coale@kci.com Comments: |
| | | Invoice To: Accounts Payable Company Name: KCI TECHNOLOGIES INC Address 1: 936 Ridgebrook Road Address 2: City, State Zip: Sparks, MD 21152 Phone No.: 410 - 316 - 0818 Email Address: ap@kci.com Comments: P.O. No.: 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) | |

Comments: 54°F; 68% RH; Clear & Sunny Conditions

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

Site Name: Poolesville High School Project: Poolesville HS Sampled By: Brittany Maas

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 ² , cm ² , ft ² * | Analysis Requested | Method Reference ^ | Hexavalent Chromium Process (e.g., welding, plating, painting, etc.) |
|---|----------------|---------------------------------------|---|--|--|---------------------------------|--|
| PHS-01D | 5/5/23 | 37mm lum PW PTFE, 2pc (black band) | 360 | L | Asphalt Fume (Benzene Soluble Fraction) | mod. NIOSH 5042; Gravimetric | |
| PHS-02D | 5/5/23 | 37mm lum PW PTFE, 2pc (black band) | 360 | L | Asphalt Fume (Benzene Soluble Fraction) | mod. NIOSH 5042; Gravimetric | |

^ 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: | <u>Brittany Maas</u> | <u>5/5/23</u> | | Received By: <u>Ana Ferreira</u> | <u>5/8/23</u> | <u>928</u> |
| 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.: 271101
 Prep No.: PSY695655
 Account No.: 17844
 Draft: 5/2/2023 2:22:56 PM

Attachment C
DustTrax Readings Data Summary Sheets

| Average Per Minute PM1 | Average per minute PM2.5 | Average Per Minute PM4 | Average Per Minute PM10 | Average Per Minute Total |
|-------------------------------|---------------------------------|-------------------------------|--------------------------------|---------------------------------|
| 0.01015 | 0.01055 | 0.01125 | 0.016 | 0.0306 |
| 0.0109 | 0.01145 | 0.0124 | 0.01785 | 0.03955 |
| 0.0091 | 0.0095 | 0.01015 | 0.0138 | 0.0216 |
| 0.00965 | 0.0099 | 0.01075 | 0.01635 | 0.02815 |
| 0.014 | 0.0146 | 0.01535 | 0.02345 | 0.0498 |
| 0.01525 | 0.0158 | 0.0172 | 0.02625 | 0.0562 |
| 0.01435 | 0.0147 | 0.01575 | 0.02595 | 0.05325 |
| 0.01435 | 0.01515 | 0.0165 | 0.0279 | 0.05895 |
| 0.0315 | 0.0332 | 0.03705 | 0.07365 | 0.15805 |
| 0.02645 | 0.02825 | 0.03255 | 0.06275 | 0.11735 |
| 0.01705 | 0.0176 | 0.01915 | 0.0313 | 0.07015 |
| 0.01325 | 0.0138 | 0.01495 | 0.02505 | 0.0465 |
| 0.0114 | 0.0118 | 0.01295 | 0.01875 | 0.03185 |
| 0.01695 | 0.0174 | 0.01815 | 0.02215 | 0.0402 |
| 0.01295 | 0.01335 | 0.01425 | 0.0184 | 0.0289 |
| 0.00985 | 0.0101 | 0.01055 | 0.01515 | 0.02785 |
| 0.01135 | 0.0118 | 0.0123 | 0.01695 | 0.032 |
| 0.01105 | 0.01135 | 0.01195 | 0.01585 | 0.02365 |
| 0.0109 | 0.01135 | 0.01195 | 0.01745 | 0.03065 |
| 0.01385 | 0.01425 | 0.01535 | 0.0219 | 0.0417 |
| 0.01455 | 0.0149 | 0.0159 | 0.02215 | 0.04795 |
| 0.0097 | 0.0102 | 0.01095 | 0.01505 | 0.0266 |
| 0.0086 | 0.00875 | 0.0093 | 0.01225 | 0.02015 |
| 0.00885 | 0.009 | 0.0097 | 0.01265 | 0.0245 |
| 0.02125 | 0.0218 | 0.0225 | 0.0264 | 0.0361 |
| 0.05925 | 0.0602 | 0.061 | 0.06445 | 0.07145 |
| 0.0582 | 0.0591 | 0.05975 | 0.06435 | 0.0722 |
| 0.08255 | 0.0832 | 0.08385 | 0.0879 | 0.09315 |
| 0.06745 | 0.068 | 0.0688 | 0.07235 | 0.0844 |
| 0.0477 | 0.04855 | 0.0507 | 0.06615 | 0.12975 |
| 0.0333 | 0.03375 | 0.0344 | 0.0381 | 0.04675 |
| 0.03295 | 0.03345 | 0.03415 | 0.0364 | 0.04705 |
| 0.028 | 0.02855 | 0.0294 | 0.0333 | 0.041 |
| 0.0265 | 0.02695 | 0.02765 | 0.0332 | 0.0449 |
| 0.03365 | 0.0347 | 0.03715 | 0.06375 | 0.1385 |
| 0.02285 | 0.02335 | 0.0248 | 0.0369 | 0.0685 |
| 0.01885 | 0.01945 | 0.0205 | 0.02905 | 0.04595 |
| 0.0389 | 0.03975 | 0.041 | 0.05065 | 0.0759 |
| 0.0565 | 0.05715 | 0.0584 | 0.0664 | 0.08625 |
| 0.0367 | 0.03725 | 0.0383 | 0.0436 | 0.06785 |
| 0.0357 | 0.03645 | 0.0379 | 0.05315 | 0.0918 |
| 0.02655 | 0.027 | 0.02785 | 0.03275 | 0.05195 |
| 0.0204 | 0.02075 | 0.02165 | 0.0279 | 0.0439 |

| Average Per Minute PM1 | Average per minute PM2.5 | Average Per Minute PM4 | Average Per Minute PM10 | Average Per Minute Total |
|-------------------------------|---------------------------------|-------------------------------|--------------------------------|---------------------------------|
| 0.02225 | 0.0226 | 0.02335 | 0.02995 | 0.0414 |
| 0.0209 | 0.02115 | 0.0221 | 0.02995 | 0.05195 |
| 0.0174 | 0.018 | 0.01885 | 0.0254 | 0.04645 |
| 0.0157 | 0.01635 | 0.0171 | 0.02215 | 0.0429 |
| 0.02035 | 0.0211 | 0.0226 | 0.032 | 0.057 |
| 0.04605 | 0.04905 | 0.05405 | 0.08375 | 0.1546 |
| 0.02735 | 0.0287 | 0.0311 | 0.0483 | 0.0859 |
| 0.02715 | 0.02865 | 0.032 | 0.05415 | 0.09845 |
| 0.0185 | 0.0194 | 0.02115 | 0.03305 | 0.05875 |
| 0.0225 | 0.02355 | 0.0255 | 0.04085 | 0.07805 |
| 0.0187 | 0.01945 | 0.02125 | 0.03335 | 0.0677 |
| 0.02315 | 0.0241 | 0.0264 | 0.0428 | 0.0863 |
| 0.021 | 0.0221 | 0.0241 | 0.03995 | 0.0777 |
| 0.02145 | 0.02255 | 0.02505 | 0.0438 | 0.09655 |
| 0.0248 | 0.0259 | 0.02765 | 0.04015 | 0.069 |
| 0.02745 | 0.0285 | 0.03105 | 0.04845 | 0.08925 |
| 0.03465 | 0.03565 | 0.0374 | 0.0489 | 0.06815 |
| 0.039 | 0.04 | 0.04155 | 0.0537 | 0.07145 |
| 0.02585 | 0.02635 | 0.02745 | 0.0333 | 0.04375 |
| 0.0249 | 0.0254 | 0.02595 | 0.0291 | 0.03735 |
| 0.0193 | 0.0195 | 0.02025 | 0.02385 | 0.0315 |
| 0.0637 | 0.0662 | 0.07295 | 0.1314 | 0.24075 |
| 0.03675 | 0.0372 | 0.0379 | 0.0407 | 0.04935 |
| 0.00975 | 0.0099 | 0.01005 | 0.0118 | 0.0145 |
| 0.0166 | 0.017 | 0.01755 | 0.02025 | 0.0241 |
| 0.01355 | 0.0137 | 0.01415 | 0.0166 | 0.02155 |
| 0.01855 | 0.0187 | 0.01965 | 0.02255 | 0.0279 |
| 0.0145 | 0.01485 | 0.0155 | 0.02055 | 0.0306 |
| 0.0139 | 0.0143 | 0.01475 | 0.01765 | 0.02655 |
| 0.00765 | 0.0078 | 0.0083 | 0.01055 | 0.01985 |
| 0.0068 | 0.007 | 0.00745 | 0.0098 | 0.0154 |
| 0.0083 | 0.0085 | 0.00895 | 0.01205 | 0.027 |
| 0.00815 | 0.00835 | 0.009 | 0.013 | 0.02435 |
| 0.0164 | 0.01725 | 0.0188 | 0.0289 | 0.0501 |
| 0.0105 | 0.01115 | 0.0123 | 0.0181 | 0.03215 |
| 0.01835 | 0.0192 | 0.0211 | 0.03335 | 0.0592 |
| 0.0251 | 0.0265 | 0.0299 | 0.0522 | 0.1137 |
| 0.02465 | 0.026 | 0.0289 | 0.05245 | 0.10585 |
| 0.03235 | 0.03365 | 0.03695 | 0.0656 | 0.14425 |
| 0.0274 | 0.0286 | 0.031 | 0.0473 | 0.0895 |
| 0.02695 | 0.028 | 0.03015 | 0.0434 | 0.07265 |
| 0.0224 | 0.0233 | 0.02505 | 0.04015 | 0.0698 |
| 0.0168 | 0.01745 | 0.0189 | 0.02725 | 0.04725 |

| Average Per Minute PM1 | Average per minute PM2.5 | Average Per Minute PM4 | Average Per Minute PM10 | Average Per Minute Total |
|-------------------------------|---------------------------------|-------------------------------|--------------------------------|---------------------------------|
| 0.01035 | 0.01075 | 0.01125 | 0.0151 | 0.0268 |
| 0.0116 | 0.012 | 0.01305 | 0.0196 | 0.0378 |
| 0.0156 | 0.0161 | 0.0173 | 0.0258 | 0.05345 |
| 0.01305 | 0.01335 | 0.0144 | 0.0207 | 0.04055 |
| 0.0132 | 0.01345 | 0.0143 | 0.01975 | 0.0282 |
| 0.0106 | 0.01095 | 0.01135 | 0.01525 | 0.0308 |
| 0.01035 | 0.01065 | 0.011 | 0.0145 | 0.0266 |
| 0.0287 | 0.0288 | 0.02925 | 0.03255 | 0.04 |
| 0.0269 | 0.0273 | 0.0277 | 0.03085 | 0.0477 |
| 0.0535 | 0.0539 | 0.05475 | 0.0618 | 0.07915 |
| 0.05705 | 0.05775 | 0.0588 | 0.06615 | 0.09135 |
| 0.038 | 0.0385 | 0.0391 | 0.0444 | 0.05505 |
| 0.0297 | 0.03015 | 0.0306 | 0.03205 | 0.03865 |
| 0.02115 | 0.02165 | 0.02195 | 0.0248 | 0.0318 |
| 0.02295 | 0.0233 | 0.0238 | 0.02665 | 0.0319 |
| 0.02805 | 0.02845 | 0.02905 | 0.03425 | 0.04325 |
| 0.0254 | 0.0258 | 0.0265 | 0.0331 | 0.04945 |
| 0.02425 | 0.02455 | 0.0251 | 0.0274 | 0.0311 |
| 0.01045 | 0.0106 | 0.0109 | 0.013 | 0.0158 |
| 0.0138 | 0.01405 | 0.0147 | 0.0181 | 0.0296 |
| 0.0172 | 0.0177 | 0.01895 | 0.0251 | 0.0429 |
| 0.02215 | 0.0231 | 0.02555 | 0.04175 | 0.0804 |
| 0.01245 | 0.0127 | 0.013 | 0.0147 | 0.019 |
| 0.01085 | 0.01105 | 0.0113 | 0.01245 | 0.0134 |
| 0.01425 | 0.01435 | 0.0146 | 0.01565 | 0.0182 |
| 0.01535 | 0.01545 | 0.0159 | 0.0174 | 0.02785 |
| 0.0124 | 0.0127 | 0.01295 | 0.014 | 0.01665 |
| 0.01175 | 0.012 | 0.01255 | 0.01445 | 0.0179 |
| 0.0115 | 0.0117 | 0.01225 | 0.01425 | 0.0183 |
| 0.01175 | 0.01185 | 0.0123 | 0.0148 | 0.0207 |
| 0.02625 | 0.0266 | 0.0273 | 0.03205 | 0.0485 |
| 0.02675 | 0.02725 | 0.028 | 0.0356 | 0.0545 |
| 0.0217 | 0.0224 | 0.0231 | 0.0283 | 0.03965 |
| 0.0412 | 0.0432 | 0.0441 | 0.04935 | 0.0586 |
| 0.0247 | 0.02525 | 0.0261 | 0.0313 | 0.05685 |
| 0.0322 | 0.03335 | 0.0344 | 0.04035 | 0.06885 |
| 0.02755 | 0.0286 | 0.0297 | 0.0342 | 0.0522 |
| 0.01945 | 0.02015 | 0.02065 | 0.0234 | 0.0294 |
| 0.02635 | 0.0274 | 0.02855 | 0.0356 | 0.06135 |
| 0.0256 | 0.02635 | 0.02695 | 0.0312 | 0.04675 |
| 0.0197 | 0.0205 | 0.0212 | 0.0257 | 0.0352 |
| 0.019 | 0.01995 | 0.0204 | 0.0252 | 0.0379 |
| 0.02285 | 0.02355 | 0.0245 | 0.0284 | 0.04335 |

| Average Per Minute PM1 | Average per minute PM2.5 | Average Per Minute PM4 | Average Per Minute PM10 | Average Per Minute Total |
|-------------------------------|---------------------------------|-------------------------------|--------------------------------|---------------------------------|
| 0.03005 | 0.03085 | 0.0324 | 0.0452 | 0.08225 |
| 0.0272 | 0.02785 | 0.02875 | 0.03375 | 0.0571 |
| 0.02115 | 0.02145 | 0.02195 | 0.02575 | 0.0295 |
| 0.02135 | 0.02185 | 0.02245 | 0.0295 | 0.0441 |
| 0.0246 | 0.02505 | 0.02635 | 0.03605 | 0.063 |
| 0.01695 | 0.01725 | 0.01775 | 0.02205 | 0.02675 |
| 0.0151 | 0.0155 | 0.01605 | 0.01815 | 0.02555 |
| 0.0175 | 0.0179 | 0.0186 | 0.0236 | 0.0357 |
| 0.01365 | 0.0141 | 0.01465 | 0.01815 | 0.02665 |
| 0.01655 | 0.01685 | 0.01795 | 0.03 | 0.06095 |
| 0.013 | 0.0133 | 0.0139 | 0.0172 | 0.0295 |
| 0.01 | 0.01015 | 0.0106 | 0.01215 | 0.01585 |
| 0.012 | 0.01245 | 0.0129 | 0.01685 | 0.01985 |
| 0.0156 | 0.01585 | 0.0165 | 0.01995 | 0.0375 |
| 0.00855 | 0.0086 | 0.0087 | 0.0108 | 0.01365 |
| 0.00905 | 0.0091 | 0.0094 | 0.01065 | 0.01575 |
| 0.01535 | 0.01555 | 0.01595 | 0.01845 | 0.02375 |
| 0.02825 | 0.02885 | 0.02975 | 0.038 | 0.0697 |
| 0.0209 | 0.02155 | 0.02215 | 0.02865 | 0.0473 |
| 0.0201 | 0.0204 | 0.0212 | 0.0279 | 0.05225 |
| 0.0205 | 0.0209 | 0.02195 | 0.029 | 0.05045 |
| 0.01755 | 0.0179 | 0.0187 | 0.0256 | 0.0495 |
| 0.021 | 0.0214 | 0.02215 | 0.0283 | 0.0444 |
| 0.02835 | 0.0288 | 0.0294 | 0.0358 | 0.04935 |
| 0.03115 | 0.03165 | 0.0324 | 0.0366 | 0.04965 |
| 0.02 | 0.02035 | 0.0209 | 0.02555 | 0.037 |
| 0.01005 | 0.01025 | 0.0106 | 0.0116 | 0.01555 |
| 0.0145 | 0.01475 | 0.01515 | 0.0184 | 0.03225 |
| 0.01285 | 0.0132 | 0.0137 | 0.01625 | 0.0238 |
| 0.0132 | 0.0136 | 0.0142 | 0.0199 | 0.03065 |
| 0.0095 | 0.0098 | 0.01015 | 0.0141 | 0.02145 |
| 0.0158 | 0.01625 | 0.01715 | 0.02275 | 0.04035 |
| 0.01685 | 0.0175 | 0.0186 | 0.0273 | 0.04885 |
| 0.01355 | 0.0141 | 0.015 | 0.02185 | 0.0332 |
| 0.0157 | 0.0164 | 0.0179 | 0.0261 | 0.04735 |
| 0.01325 | 0.0139 | 0.01525 | 0.02325 | 0.0511 |
| 0.01435 | 0.01515 | 0.01705 | 0.03075 | 0.0551 |
| 0.0176 | 0.01835 | 0.0202 | 0.03385 | 0.05565 |
| 0.0207 | 0.02195 | 0.02435 | 0.04445 | 0.08455 |
| 0.01355 | 0.01435 | 0.01615 | 0.02815 | 0.05465 |
| 0.0144 | 0.0152 | 0.017 | 0.03075 | 0.0549 |
| 0.0256 | 0.0268 | 0.03005 | 0.055 | 0.13755 |
| 0.02065 | 0.02175 | 0.02405 | 0.04615 | 0.1073 |

| Average Per Minute PM1 | Average per minute PM2.5 | Average Per Minute PM4 | Average Per Minute PM10 | Average Per Minute Total |
|-------------------------------|---------------------------------|-------------------------------|--------------------------------|---------------------------------|
| 0.0142 | 0.0151 | 0.01665 | 0.0306 | 0.057 |
| 0.01265 | 0.0134 | 0.01495 | 0.0257 | 0.05505 |
| 0.0093 | 0.00985 | 0.0108 | 0.01835 | 0.0437 |
| 0.0113 | 0.01165 | 0.0126 | 0.02225 | 0.06285 |
| 0.02935 | 0.03015 | 0.0327 | 0.05665 | 0.1413 |
| 0.02915 | 0.0304 | 0.03415 | 0.06695 | 0.15695 |
| 0.0166 | 0.01725 | 0.01895 | 0.0369 | 0.07945 |
| 0.0111 | 0.0116 | 0.0128 | 0.0233 | 0.04835 |
| 0.0111 | 0.01145 | 0.0127 | 0.0234 | 0.06045 |
| 0.014 | 0.0149 | 0.01645 | 0.03075 | 0.0751 |
| 0.0104 | 0.01065 | 0.0116 | 0.0189 | 0.0342 |
| 0.0052 | 0.0055 | 0.00575 | 0.00945 | 0.01855 |
| 0.0053 | 0.0055 | 0.00605 | 0.0104 | 0.0161 |
| 0.00525 | 0.00565 | 0.0061 | 0.0104 | 0.0158 |
| 0.0079 | 0.0081 | 0.0087 | 0.0129 | 0.02695 |
| 0.01325 | 0.01375 | 0.01515 | 0.02695 | 0.0643 |
| 0.00765 | 0.00805 | 0.0089 | 0.0149 | 0.0279 |
| 0.0063 | 0.0066 | 0.00735 | 0.0125 | 0.0216 |
| 0.00895 | 0.00945 | 0.01055 | 0.0197 | 0.03745 |
| 0.00895 | 0.0092 | 0.00995 | 0.01995 | 0.03995 |
| 0.00415 | 0.0042 | 0.0045 | 0.0065 | 0.0171 |
| 0.00755 | 0.0078 | 0.00865 | 0.01585 | 0.0328 |
| 0.0069 | 0.00715 | 0.008 | 0.015 | 0.0302 |
| 0.01395 | 0.01465 | 0.0162 | 0.02835 | 0.05905 |
| 0.0309 | 0.03195 | 0.03535 | 0.0731 | 0.17765 |
| 0.03015 | 0.03135 | 0.03435 | 0.06665 | 0.17045 |
| 0.02025 | 0.0211 | 0.0238 | 0.0488 | 0.1098 |
| 0.0178 | 0.0187 | 0.0207 | 0.03785 | 0.0815 |
| 0.0164 | 0.0171 | 0.01875 | 0.03355 | 0.07485 |
| 0.0131 | 0.01375 | 0.015 | 0.02685 | 0.06065 |
| 0.0088 | 0.00925 | 0.0104 | 0.01775 | 0.03785 |
| 0.01005 | 0.0106 | 0.0115 | 0.0211 | 0.0523 |
| 0.01345 | 0.01375 | 0.0149 | 0.0282 | 0.07305 |
| 0.0177 | 0.01835 | 0.01995 | 0.0397 | 0.09255 |
| 0.0074 | 0.00775 | 0.00855 | 0.0135 | 0.0271 |
| 0.00705 | 0.00725 | 0.0077 | 0.01245 | 0.0258 |
| 0.0048 | 0.0052 | 0.00555 | 0.01 | 0.0176 |
| 0.00555 | 0.0058 | 0.00645 | 0.0103 | 0.02555 |
| 0.00785 | 0.0082 | 0.0088 | 0.01585 | 0.04055 |
| 0.00735 | 0.00775 | 0.00805 | 0.01295 | 0.0287 |
| 0.00645 | 0.0067 | 0.00735 | 0.0134 | 0.02615 |
| 0.00475 | 0.005 | 0.00555 | 0.00885 | 0.0182 |
| 0.00475 | 0.00515 | 0.0057 | 0.01045 | 0.02115 |

| Average Per Minute PM1 | Average per minute PM2.5 | Average Per Minute PM4 | Average Per Minute PM10 | Average Per Minute Total |
|-------------------------------|---------------------------------|-------------------------------|--------------------------------|---------------------------------|
| 0.00505 | 0.00535 | 0.0059 | 0.0108 | 0.02165 |
| 0.00235 | 0.00245 | 0.00265 | 0.00445 | 0.0082 |
| 0.00335 | 0.00355 | 0.0038 | 0.00675 | 0.01815 |
| 0.0055 | 0.0058 | 0.00635 | 0.0145 | 0.03425 |
| 0.00585 | 0.00605 | 0.0072 | 0.01445 | 0.0302 |
| 0.0048 | 0.005 | 0.0056 | 0.01245 | 0.02785 |
| 0.0025 | 0.00265 | 0.0031 | 0.0057 | 0.0129 |
| 0.00865 | 0.00895 | 0.00965 | 0.01555 | 0.03045 |
| 0.00705 | 0.0074 | 0.00845 | 0.01635 | 0.03705 |
| 0.0061 | 0.00655 | 0.00765 | 0.0157 | 0.0357 |
| 0.01455 | 0.01505 | 0.01625 | 0.0282 | 0.0589 |
| 0.00515 | 0.0054 | 0.0064 | 0.01235 | 0.02695 |
| 0.008 | 0.00825 | 0.0089 | 0.0163 | 0.0446 |
| 0.0192 | 0.0199 | 0.02205 | 0.04535 | 0.1211 |
| 0.01005 | 0.01035 | 0.01175 | 0.02245 | 0.06185 |
| 0.00985 | 0.01035 | 0.0115 | 0.0233 | 0.04235 |
| 0.0161 | 0.01635 | 0.01765 | 0.0331 | 0.0797 |
| 0.01395 | 0.0144 | 0.0157 | 0.02585 | 0.0571 |
| 0.00955 | 0.00985 | 0.01085 | 0.02165 | 0.05515 |
| 0.00565 | 0.006 | 0.0067 | 0.0131 | 0.03015 |
| 0.0058 | 0.00605 | 0.00675 | 0.015 | 0.03885 |
| 0.0073 | 0.0076 | 0.00845 | 0.01805 | 0.04365 |
| 0.0025 | 0.0027 | 0.00295 | 0.00585 | 0.0145 |
| 0.00345 | 0.00375 | 0.00395 | 0.00775 | 0.0171 |
| 0.0039 | 0.00415 | 0.00475 | 0.00965 | 0.0211 |
| 0.00305 | 0.0033 | 0.00375 | 0.00655 | 0.0207 |
| 0.00715 | 0.00755 | 0.0081 | 0.01425 | 0.02555 |
| 0.00855 | 0.009 | 0.00995 | 0.01815 | 0.0402 |
| 0.0042 | 0.00445 | 0.00485 | 0.0098 | 0.0208 |
| 0.0078 | 0.00795 | 0.0088 | 0.0151 | 0.0278 |
| 0.00295 | 0.00305 | 0.0037 | 0.0092 | 0.01805 |
| 0.0088 | 0.0092 | 0.01005 | 0.01945 | 0.04075 |
| 0.0036 | 0.0037 | 0.00425 | 0.01065 | 0.0211 |
| 0.0041 | 0.0044 | 0.0053 | 0.0134 | 0.03925 |
| 0.0104 | 0.0109 | 0.0126 | 0.0251 | 0.06045 |
| 0.0094 | 0.01005 | 0.01105 | 0.02705 | 0.0649 |
| 0.00595 | 0.0064 | 0.00725 | 0.01575 | 0.03395 |
| 0.01075 | 0.01135 | 0.01305 | 0.02585 | 0.0611 |
| 0.0078 | 0.00815 | 0.00915 | 0.01565 | 0.04055 |
| 0.022 | 0.0237 | 0.02725 | 0.05795 | 0.11505 |
| 0.06165 | 0.0663 | 0.07805 | 0.168 | 0.34785 |
| 0.02595 | 0.02805 | 0.0332 | 0.0744 | 0.158 |
| 0.0145 | 0.0152 | 0.0166 | 0.0287 | 0.0628 |

| Average Per Minute PM1 | Average per minute PM2.5 | Average Per Minute PM4 | Average Per Minute PM10 | Average Per Minute Total |
|-------------------------------|---------------------------------|-------------------------------|--------------------------------|---------------------------------|
| 0.02605 | 0.0278 | 0.0324 | 0.0737 | 0.1613 |
| 0.00405 | 0.00455 | 0.0053 | 0.0122 | 0.0282 |
| 0.0091 | 0.0096 | 0.011 | 0.02075 | 0.04445 |
| 0.0042 | 0.0045 | 0.00515 | 0.0095 | 0.01945 |
| 0.00315 | 0.00345 | 0.00435 | 0.0091 | 0.0175 |
| 0.0074 | 0.00765 | 0.0084 | 0.01475 | 0.02775 |
| 0.00305 | 0.00315 | 0.0039 | 0.00835 | 0.0261 |
| 0.00145 | 0.00155 | 0.0021 | 0.00535 | 0.01075 |
| 0.0021 | 0.00235 | 0.0028 | 0.0079 | 0.0155 |
| 0.0031 | 0.00335 | 0.0041 | 0.00855 | 0.02275 |
| 0.05925 | 0.06085 | 0.06655 | 0.1281 | 0.33685 |
| 0.04465 | 0.04595 | 0.0507 | 0.10415 | 0.29 |
| 0.0324 | 0.0335 | 0.03625 | 0.0704 | 0.20975 |
| 0.0065 | 0.0068 | 0.00775 | 0.0153 | 0.0436 |
| 0.0142 | 0.01475 | 0.0166 | 0.036 | 0.08315 |
| 0.0176 | 0.0185 | 0.02135 | 0.04835 | 0.11355 |
| 0.0141 | 0.0149 | 0.0171 | 0.03935 | 0.09055 |
| 0.01305 | 0.0136 | 0.0154 | 0.03245 | 0.0753 |
| 0.01285 | 0.0136 | 0.0157 | 0.03355 | 0.06975 |
| 0.0081 | 0.00855 | 0.0099 | 0.02295 | 0.05075 |
| 0.01135 | 0.0119 | 0.01385 | 0.0317 | 0.0566 |
| 0.01195 | 0.0129 | 0.0154 | 0.0354 | 0.07815 |
| 0.00695 | 0.00745 | 0.0089 | 0.0198 | 0.048 |
| 0.0105 | 0.01115 | 0.01275 | 0.02725 | 0.063 |
| 0.20155 | 0.21795 | 0.24965 | 0.4552 | 0.8073 |
| 0.14245 | 0.1557 | 0.181 | 0.34125 | 0.6106 |
| 0.1328 | 0.1448 | 0.1679 | 0.31615 | 0.5806 |
| 0.1869 | 0.2047 | 0.23825 | 0.45555 | 0.83215 |
| 0.394 | 0.43405 | 0.5074 | 0.9529 | 1.58605 |
| 0.25385 | 0.2793 | 0.3241 | 0.60195 | 1.026 |
| 0.26685 | 0.29445 | 0.34425 | 0.63405 | 1.05625 |
| 0.3376 | 0.3704 | 0.4304 | 0.7707 | 1.2824 |
| 0.20855 | 0.2292 | 0.26725 | 0.50395 | 0.85765 |
| 0.23975 | 0.26455 | 0.3085 | 0.5764 | 0.93295 |
| 0.21435 | 0.2377 | 0.27855 | 0.50595 | 0.8318 |
| 0.17355 | 0.19225 | 0.22575 | 0.4223 | 0.70495 |
| 0.14415 | 0.16085 | 0.1914 | 0.3526 | 0.5466 |
| 0.25515 | 0.28205 | 0.3314 | 0.62665 | 1.0205 |
| 0.13035 | 0.14615 | 0.1745 | 0.3236 | 0.48725 |
| 0.07535 | 0.0845 | 0.09995 | 0.18715 | 0.3091 |
| 0.0206 | 0.0231 | 0.0276 | 0.0517 | 0.0838 |
| 0.07335 | 0.08255 | 0.09855 | 0.17455 | 0.2608 |
| 0.0789 | 0.08845 | 0.10435 | 0.18995 | 0.2823 |

| Average Per Minute PM1 | Average per minute PM2.5 | Average Per Minute PM4 | Average Per Minute PM10 | Average Per Minute Total |
|-------------------------------|---------------------------------|-------------------------------|--------------------------------|---------------------------------|
| 0.20265 | 0.2228 | 0.26005 | 0.48145 | 0.7959 |
| 0.26415 | 0.29025 | 0.34025 | 0.65515 | 1.1335 |
| 0.0217 | 0.023 | 0.0259 | 0.0477 | 0.09625 |
| 0.021 | 0.023 | 0.026 | 0.064 | 0.102 |

Attachment D
Dust Monitoring Results Summary Chart

Dust Monitoring Results Summary Chart

