



**CONESTOGA-ROVERS
& ASSOCIATES**

14496 Sheldon Road, Suite 200, Plymouth, MI 48170
Telephone: (734) 453-5123 Fax: (734) 453-5201
www.CRAworld.com

December 17, 2012

Reference No. 074865-07

Mr. Patrick Gallagher
Vice-President
Gallagher Asphalt Corporation
18100 S. Indiana Avenue
Thornton, IL 60476-1276

VIA EMAIL ONLY (PDF)

Dear Mr. Gallagher:

Re: Results of Industrial Hygiene Sampling
Volatile Organic Compounds and Hydrogen Sulfide
Pavement Recycling Project
Lancaster, California

1.0 INTRODUCTION

As requested by Gallagher Asphalt Corporation (Gallagher), Conestoga-Rovers & Associates, Inc. (CRA) conducted a limited industrial hygiene survey (Survey) of the Gallagher roadway resurfacing project being conducted in Lancaster, California (Site) on November 27, 2012. The Survey was requested as a result of a report in Massachusetts alleging acute health effects being experienced by students and faculty at the University of Massachusetts - Amherst campus (UMass), in which the students and faculty attributed to H₂S and VOC emissions from similar, nearby paving operations and to confirm results of the Massachusetts Survey conducted in Amherst, Massachusetts on November 10, 2012. The Survey included air sampling for the following parameters:

- Total Hydrocarbons
- Hydrogen Sulfide (H₂S)

CRA utilized total hydrocarbons as a surrogate for total volatile organic compounds (VOCs).

Tables 1 and 2 present the results of the air sampling conducted. Sample results exceeding the Occupational Safety and Health Administration (OSHA) or California OSHA (Cal OSHA) Permissible Exposure Limits (PELs) for the construction industry, if existing, have been highlighted in the result tables. Additionally, for H₂S, Table 1 compares the sampling results, calculated as if short term (15 minute) and peak (10 minute) samples, to OSHA and Cal OSHA PELs for general industry. Lastly, both tables provide a comparison to the sampling results from the November 10, 2012 Survey.

The laboratory analytical report and chain of custody can be found in Attachment A.

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ENGINEERING DESIGN



2.0 RESULTS SUMMARY AND DISCUSSION OF FINDINGS

2.1 TOTAL HYDROCARBONS

CRA conducted sampling for total hydrocarbons as a surrogate for total volatile organic compounds (VOCs).

All samples had results below the level of quantification (LOQ) of 40 micrograms (μg), which calculates to an air concentration of approximately less than 2.0 parts per million (ppm), or less than approximately 7.0 milligrams per cubic meter (mg/m^3).

While a PEL has not been established for either total hydrocarbons or total VOCs by OSHA or Cal OSHA, as air dispersion modeling previously conducted by CRA indicates that concentrations of VOCs in air decreases with increasing distance, it is CRA's opinion that total hydrocarbon emissions from Site operations have not adversely affected the UMass campus or the adjacent locations in California.

Additionally, as the California sample results were nearly identical to the total hydrocarbon sample results from the November 10, 2012 Massachusetts Survey, it is CRA's opinion that emission of total hydrocarbons from Gallagher's asphalt roadway resurfacing equipment have been adequately characterized.

2.2 HYDROGEN SULFIDE

As with total hydrocarbons, all samples had results below the LOQ of 1.2 μg , which calculates to an air concentration of approximately less than 0.080 ppm. For the construction industry, OSHA and Cal OSHA have established a PEL for H_2S of 10 ppm. All sample results are two orders of magnitude less than the PEL.

Additionally, OSHA and Cal OSHA have established a Short-Term Exposure Limit (STEL) and a Ceiling Limit 20 ppm and 50 ppm, respectively. To compare sampling results to the OSHA and Cal OSHA STEL and Ceiling Limit, CRA assumed the total mass of H_2S collected during the sampling was collected within a 15 minute and a 10 minute span, the respective sampling periods for the OSHA and Cal OSHA STEL and Ceiling Limit. The adjusted STEL sampling result was an order of magnitude below both the OSHA and Cal OSHA STEL. Additionally, the adjusted Ceiling sampling result was approximately one thirty-fifth (1/35) of both the OSHA and Cal OSHA Ceiling Limit.



As the results of sampling were significantly lower than both OSHA PELs, and, as with VOCs, the previous air dispersion modeling conducted by CRA indicates decreasing air concentrations with increasing distances; it is CRA's opinion that Site operations have not adversely impacted the UMass campus or the adjacent locations in California.

Additionally, as with sampling results for total hydrocarbons, as the sample results were nearly identical to the H₂S sample results from the November 10, 2012 Survey, it is CRA's opinion that emission of H₂S from Gallagher's asphalt roadway resurfacing equipment have been adequately characterized.

3.0 SAMPLING AND ANALYTICAL METHODS

Described below are the sampling methods utilized during the Survey. Meteorological conditions during the Survey are summarized in Appendix B. Sampling was conducted in a general downwind direction from Gallagher's operations.

Samples for all of the parameters assessed were submitted for analysis, under chain of custody documentation, to Galson Laboratories in East Syracuse, New York, a laboratory accredited by the American Industrial Hygiene Association (AIHA).

3.1 TOTAL HYDROCARBONS

Air samples for total hydrocarbons were collected in accordance with the National Institute for Occupational Safety and Health (NIOSH) method number 1500/1501 (NIOSH 1500/1501) titled "Hydrocarbons, BP 36°-216 °C" / "Aromatic Hydrocarbons". Air samples for total hydrocarbons were collected with passive organic vapor monitoring badges (3M[®] 3500). Samples were collected for approximately three hours. Field blanks were submitted for analysis with the samples. Samples were analyzed using a gas chromatograph equipped with a flame ionization detector (GC/FID) in accordance with the modified NIOSH 1501 method. The level of quantification was 40 µg. Samples were mounted at approximately five feet above ground level to replicate typical breathing zone positions.

3.2 HYDROGEN SULFIDE

Air samples for H₂S were collected with passive vapor monitoring badges (Radiello). Samples were collected for approximately three hours. Field blanks were submitted for analysis with the samples. Samples were analyzed using a spectrophotometer. The level of quantification was



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1.2 µg. Samples were mounted at approximately five feet above ground level to replicate typical breathing zone positions.

4.0 CLOSING

The samples collected were representative of the activities and work area conditions on the day the monitoring was conducted. Any change in the work area, production activities, work practices, or environmental conditions may affect the monitoring results. The result in this report reflects the environmental conditions at the time of the sampling events and does not necessarily reflect a continuous, steady state condition.

If you have any questions, please feel free to contact me at (734) 453-5123.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Report prepared by:

A handwritten signature in black ink that reads "Eric Jones".

Eric Jones

Report reviewed and approved by:

A handwritten signature in black ink that reads "Mitchell S. Bergner".

Mitchell Bergner, MS, CIH, ROH

ERJ/bw/3/Det.

Encl.

cc: Sube Vel, CRA
Mitch Bergner, CRA

TABLES

TABLE 1

PRIVILEGED AND CONFIDENTIAL
ATTORNEY WORK-PRODUCT

**INDUSTRIAL HYGIENE AIR SAMPLING RESULTS
HYDROGEN SULFIDE
GALLAGHER ASPHALT CORPORATION PAVEMENT RECYCLING
LANCASTER, CALIFORNIA
NOVEMBER 27, 2012**

<i>Location</i>	<i>Location ID</i>	<i>Sample Date</i>	<i>Sample Identification</i>	<i>Sample Type</i>	<i>Average Sample Temperature (°F)</i>	<i>Sample Time (minutes)</i>	<i>Total H₂S (µg)</i>	<i>Sampling Result (ppm)¹</i>	<i>OSHA CONSTRUCTION PEL (ppm)</i>	<i>Adjusted Sampling Result (ppm)³</i>	<i>OSHA GENERAL INDUSTRY PEL⁴ (ppm)</i>
30th Street East	Station 1	11/27/2012	074865-111012-002	Area	58.4	174	<1.2	<0.082	10	<0.951 <1.427	20 50
30th Street East	Station 2	11/27/2012	074865-112712-004	Area	58.4	182	<1.2	<0.078	10	<0.951 <1.427	20 50
30th Street East	Station 3	11/27/2012	074865-112712-006	Area	58.4	180	<1.2	<0.079	10	<0.951 <1.427	20 50
<i>Amherst, MA Sampling Results</i>											
University Drive	Station 1	11/10/2012	074865-111012-002	Area	59.8	150	<1.2	<0.094	10	<0.941 <1.412	20 50
University Drive	Station 2	11/10/2012	074865-111012-004	Area	59.8	150	<1.2	<0.094	10	<0.941 <1.412	20 50
University Drive	Station 3	11/10/2012	074865-111012-006	Area	59.8	150	<1.2	<0.094	10	<0.941 <1.412	20 50

¹ Calculated by CRA.² For the construction industry.³ Calculated by CRA. Assumes entire amount was collected as a short-term (15 minute) sample (top) and as a peak (10 minute) sample (bottom).⁴ For General Industry. Ceiling Limit / Peak Limit

TABLE 2

INDUSTRIAL HYGIENE AIR SAMPLING RESULTS
 TOTAL HYDROCARBONS
 GALLAGHER ASPHALT CORPORATION PAVEMENT RECYCLING
 LANCASTER, CALIFORNIA
 NOVEMBER 27, 2012

Location	Location ID	Sample Date	Sample Identification	Sample Type	Sample Time (minutes)	Sampling Result (ppm)	Sampling Result (mg/m ³)	OSHA PEL (ppm)	OSHA PEL (mg/m ³)
30th Street East	Station 1	11/27/2012	074865-112712-001	Area	182	<1.9	<6.9	N/A	N/A
30th Street East	Station 2	11/27/2012	074865-112712-003	Area	177	<2.0	<7.1	N/A	N/A
30th Street East	Station 3	11/27/2012	074865-112712-005	Area	175	<2.0	<7.1	N/A	N/A
Amherst, MA Sampling Results									
University Drive	Station 1	11/10/2012	074865-111012-001	Area	150	<2.4	<8.3	N/A	N/A
University Drive	Station 2	11/10/2012	074865-111012-003	Area	150	<2.4	<8.3	N/A	N/A
University Drive	Station 3	11/10/2012	074865-111012-005	Area	150	<2.4	<8.3	N/A	N/A

ATTACHMENT A

LABORATORY ANALYTICAL REPORT/CHAIN-OF-CUSTODY



**Mr. Eric Jones
Conestoga-Rovers & Associates
14496 Sheldon Road
Suite 200
Plymouth, MI 48170**

December 06, 2012

**DOH ELAP# 11626
AIHA # 100324**

Account# 15962

Login# L279213

Dear Mr. Jones:

Enclosed are the analytical results for the samples received by our laboratory on November 29, 2012. All test results meet the quality control requirements of AIHA 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. Unless otherwise requested, all samples will be discarded 14 days from the date of this report.

Current Scopes of Accreditation can be viewed at www.galsonlabs.com in the accreditations section under the "about Galson" tab.

Please contact Patty Gregorich at (888)-432-5227, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

**Mary G. Unangst
Laboratory Director**

Enclosure(s)



LABORATORY ANALYSIS REPORT

6601 Kirkville Road East Syracuse, NY 13057 (315) 432-5227 FAX: (315) 437-0571 www.galsonlabs.com	Client : Conestoga-Rovers & Associates Site : Gallagher, Lancaster, CA Project No. : 074865-05 Date Sampled : 27-NOV-12 Date Received : 29-NOV-12 Date Analyzed : 04-DEC-12 Report ID : 762347	Account No.: 15962 Login No. : L279213
---------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------

Hydrogen Sulfide

<u>Sample ID</u>	<u>Lab ID</u>	<u>Time minutes</u>	<u>Total ug</u>	<u>ppm</u>
074865-112712-HSBLK	L279213-5	NA	<1.2	NA
074865-112712-002	L279213-6	174	<1.2	<0.082
074865-112712-004	L279213-7	182	<1.2	<0.078
074865-112712-006	L279213-8	180	<1.2	<0.079

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

Level of quantitation: 1.2 ug	Submitted by: MJK/AJD/JS
Analytical Method : In-house: WET-SOP-13; Colorimetric	Approved by : JGC
OSHA PEL (TWA) : 20 ppm CEIL	Date : 05-DEC-12 NYS DOH # : 11626
Collection Media : Radiello	QC by: Karen Becker

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



LABORATORY ANALYSIS REPORT

6601 Kirkville Road	Client	: Conestoga-Rovers & Associates
East Syracuse, NY 13057	Site	: Gallagher, Lancaster, CA
(315) 432-5227	Project No.	: 074865-05
FAX: (315) 437-0571	Date Sampled	: 27-NOV-12
www.galsonlabs.com	Date Received	: 29-NOV-12
	Date Analyzed	: 30-NOV-12
	Report ID	: 762574
	Account No.:	: 15962
	Login No.:	: L279213

Total Hydrocarbons

<u>Sample ID</u>	<u>Lab ID</u>	<u>Time</u> <u>minutes</u>	<u>Raw</u> <u>ug</u>	<u>Total</u> <u>ug</u>	<u>Conc</u> <u>mq/m3</u>	<u>ppm</u>
074865-112712-HCBLK	L279213-1	NA	<40	<40	NA	NA
074865-112712-001	L279213-2	182	<40	<40	<6.9	<1.9
074865-112712-003	L279213-3	177	<40	<40	<7.1	<2.0
074865-112712-005	L279213-4	175	<40	<40	<7.1	<2.0

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

Level of quantitation: 40. ug	Submitted by: mln
Analytical Method : mod. NIOSH 1500/1501; GC/FID BADGE	Approved by : tlh
OSHA PEL (TWA) : NA	Date : 06-DEC-12 NYS DOH # : 11626
Collection Media : M3M-3500	QC by: Karen Becker

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



LABORATORY FOOTNOTE REPORT

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

Client Name : Conestoga-Rovers & Associates
Site : Gallagher, Lancaster, CA
Project No. : 074865-05

Date Sampled : 27-NOV-12
Date Received: 29-NOV-12
Date Analyzed: 30-NOV-12 - 04-DEC-12

Account No.: 15962
Login No. : L279213

Unless otherwise noted below, all quality control results associated with the samples were within established control limits.

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 in order to fit the report format 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.

L279213 (Report ID: 762347):
SOPs: WET-SOP-13(2)
The sampling rate, used in the concentration calculation, is based on the temperature provided with the sample.

L279213 (Report ID: 762574):
Total ug corrected for a desorption efficiency of 100%.
SOPs: GC-SOP-12(5), GC-SOP-16(9), GC-SOP-9(8)
The total VOC analysis should be used for screening purposes only. All values are estimated based on the response of n-Hexane. The sample extracts will be kept for a maximum of 30 days from the receipt date. Please contact client services in regards to the re-analysis of the sample(s) for the tentatively identified compounds. For the sample(s) that are non-detect no tentative identifications will be provided.

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



6601 Kirkville Rd
 East Syracuse, NY 13057
 Tel: 315-437-LABS(5227)
 888-432-LABS(5227)
 Fax: 315-437-0571
 www.galsonlabs.com

Check if change of address
 New Client? yes
 no

Report To : Eric Jones
Conestoga-Rovers & Associates
14496 North Sheldon Road
Plymouth, MI 48170
 Phone No. : (734) 357-5534
 Client Account # : 15926

Invoice To : CRA - Account Payable
2055 Niagara Falls Boulevard, Suite #3
Niagara Falls, New York
 Phone No. : (716) 297-6150
 Fax No. : (716) 297-2265

Site Name : Gallagher - Lancaster, CA Project : 074865-05 Sampled By : Subbarao Nagulapaty

Need Results By:	(surcharge)
<input checked="" type="checkbox"/> 5 Business Days	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%

Verbal Authorization : _____
 Purchase Order No. : 074865-07
 Credit Card No. : _____ Card Holder Name : _____ Exp. : _____
 Fax Results To : _____ Fax No. : _____
 Email Results To : ejones@croworld.com

Sample Identification	Date Sampled	Collection Medium	*Air Volume (liters)/ Passive Monitors (Min)	Analysis Requested	Method Reference	Specific DL Needed
074865-112712-HCBLANK	11/27/2012	3M 3500	----	Total Hydrocarbons	N1500/1501	40 µg
074865-112712-001	11/27/2012	3M 3500	182 min	Total Hydrocarbons	N1500/1501	40 µg
074865-112712-003	11/27/2012	3M 3500	177 min	Total Hydrocarbons	N1500/1501	40 µg
074865-112712-005	11/27/2012	3M 3500	175 min	Total Hydrocarbons	N1500/1501	40 µg
074865-112712-HSBLANK	11/27/2012	Radiello	----	Hydrogen Sulfide	WET-SOP-13	1.2 µg
074865-112712-002	11/27/2012	Radiello	174 min	Hydrogen Sulfide	WET-SOP-13	1.2 µg
074865-112712-004	11/27/2012	Radiello	182 min	Hydrogen Sulfide	WET-SOP-13	1.2 µg
074865-112712-006	11/27/2012	Radiello	180 min	Hydrogen Sulfide	WET-SOP-13	1.2 µg

IF YOU DO NOT WANT A LABORATORY BLANK ADDED PLEASE CHECK BOX. If blanks are not submitted or box is not checked, our policy states that a laboratory blank will be added for each analyte and it will be charged at normal rate.

List description of industry or process/ interferences present in sampling area: Roadway Resurfacing

Chain of Custody	Print Name	Signature	Date/Time
Relinquished by :	<u>SUBBARAO NAGULAPATY</u>	<u>[Signature]</u>	<u>11/27/2012 04:50PM</u>
Received by LAB :	<u>[Signature]</u>	<u>[Signature]</u>	<u>11/29/12 9:20</u>

Login # : _____ Samples received after 3pm will be considered as next day's business *Collection Time(min) X LPM = Air Vol. (L)

ATTACHMENT B

WEATHER DATA

ATTACHMENT B

WEATHER DATA

<i>Time</i>	<i>Temperature (°F)</i>	<i>Pressure (inches)</i>	<i>Wind Direction</i>	<i>Wind Speed (mph)</i>	<i>Wind Speed Gust (mph)</i>	<i>Humidity</i>	<i>Hourly Precipitation (inches)</i>	<i>Clouds</i>
8:00 AM	42.1	30.32	WSW	0	0	62	0	Not Reported
8:30 AM	45.9	30.32	WSW	0	0	52	0	Not Reported
8:35 AM	46.2	30.32	WSW	0	0	50	0	Not Reported
9:00 AM	48.2	30.33	WSW	0	1	43	0	Not Reported
9:30 AM	52	30.33	WSW	0	2	37	0	Not Reported
10:00 AM	55	30.32	WSW	0	1	35	0	Not Reported
10:31 AM	58.6	30.31	WSW	0	1	31	0	Not Reported
11:01 AM	59.9	30.3	WSW	0	0	30	0	Not Reported
11:31 AM	61.3	30.28	WSW	0	1	30	0	Not Reported
12:01 PM	63.1	30.26	WSW	0	1	29	0	Not Reported
12:31 PM	63.9	30.25	WSW	0	1	30	0	Not Reported
1:01 PM	65.3	30.23	WSW	0	6	27	0	Not Reported
1:32 PM	65.8	30.22	WSW	0	Not Reported	27	0	Not Reported
2:02 PM	66.7	30.21	WSW	0	Not Reported	27	0	Not Reported
2:32 PM	67.6	30.2	WSW	0	Not Reported	27	0	Not Reported
3:02 PM	68.2	30.19	WSW	0	4	28	0	Not Reported
3:32 PM	67.6	30.19	WSW	0	0	28	Not Reported	Not Reported
4:03 PM	67.3	30.19	WSW	0	Not Reported	27	Not Reported	Not Reported
4:28 PM	66.9	30.19	WSW	0	Not Reported	28	Not Reported	Not Reported
4:58 PM	65.7	30.2	WSW	0	Not Reported	30	Not Reported	Not Reported
5:28 PM	63	30.2	WSW	0	Not Reported	32	Not Reported	Not Reported
5:58 PM	61.3	30.21	WSW	0	Not Reported	35	Not Reported	Not Reported

From weather station KCALANCA14 - J West @ 30th St, Lancaster, California