CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

CSXT Crude Oil Derailment
Phase II: Transfer Operations

Air Monitoring and Sampling Report

Lynchburg, Virginia

5/5/2014 – 5/8/2014

CTEH® Project Number: 106190

Project Number: R000129324

Contract Number: ENV0000115704

August 2014

Table of Contents

List of Tables

List of Figures

List of Appendices

Executive Summary

At 1432 EDT[1] on April 30, 2014, the Center for Toxicology and Environmental Health® (CTEH®) was requested to provide toxicology and air monitoring support in response to a crude oil train derailment and fire in Lynchburg, VA. The response involved several distinct phases which mirrored the changes from the initial emergency response through product transfer and wrecking operations. Members of the CTEH® Toxicology Emergency Response Program (TERP®) provided air monitoring support throughout the duration of each phase of the incident. Phase II of the incident, the focus of this report, consisted of transfer operations for 16 of the cars involved in the derailment and the transfer of product from a frac tank staging facility. Throughout the duration of Phase II, CTEH® conducted air monitoring and sampling to evaluate the potential presence of airborne crude oil constituents in the work area and surrounding community using real-time air monitoring equipment and analytical air sampling methods. The constituents monitored and sampled for included benzene, toluene, ethylbenzene, n-hexane, xylene, hydrogen sulfide (H_2S), lower explosive limit (LEL), and volatile organic compounds (VOCs).

Phase II air monitoring began on May 5, 2014, and was conducted in two distinct zones: community and work area. The work area monitoring was further divided into the transfer area and the frac tank staging area. CTEH® personnel used manually-logged real-time air monitoring instruments and analytical air sampling methods to provide air monitoring coverage in the work area and community throughout the duration of all transfer operations. Analytical stations were staged at the perimeter of the derailment site to provide analytical air sampling data throughout transfer operations.

Throughout the duration of Phase II of the incident, there were no detections of any chemicals of interest in the community surrounding the transfer area. In the work areas, detections of benzene, VOCs, and LEL were recorded; however, no detections of any chemicals of interest were sustained for the 15 minute interval required to meet site-specific action levels. Protective actions were still taken and work activities were stopped to reassess site safety measures following instantaneous elevated detections of VOCs and LEL. Analytical air sampling analyses indicated no detections of any chemicals of interest at the perimeter of the transfer work area. Based on the results of real-time monitoring and analytical air sampling, there were no airborne crude oil constituents present at sustained concentrations that would represent a health concern to workers or members of the community during Phase II operations.

CTEH® air monitoring activities for Phase II in the established work areas and surrounding community in Lynchburg, VA concluded on May 8, 2014.

[1] All times are reported in Eastern Daylight Time (EDT).

1.0 Description of the Incident and Response

At approximately 1432 EDT on April 30, 2014, CSXT requested that the Center for Toxicology and Environmental Health (CTEH®) provide toxicology and air monitoring support in response to a train derailment and fire involving crude oil tank cars in Lynchburg, VA. Preliminary reports indicated that 17 tank cars were involved in the derailment. Three of the tank cars were partially submerged in the James River, and one car was on fire. A map of the incident site is provided in **Figure 1.0.**

The response involved several distinct phases which mirrored the changes from the initial emergency response through product transfer and wrecking operations. CTEH® provided air monitoring support throughout the duration of each phase of the incident. During Phase I of the incident, the damaged tank cars were staged parallel to the adjacent rail line where the receiving cars were to be positioned for the transfer. This report covers air monitoring support provided during the transfer operations, designated as Phase II.

Phase II began on May 5, 2014, and encompassed transfer operations for 16 of the derailed tank cars damaged in the incident, as well as the transfer of product from the frac tank staging area. Phase II included three separate transfer operations: the transfer of excess product from derailed tank cars to designated overflow receiving cars (overflow transfers), the transfer of product from derailed tank cars to empty receiving tank cars (tank to tank transfers), and the transfer of previously-transferred product held in frac tanks to designated receiving tank cars (frac tank transfers). Vacuum trucks were utilized for overflow transfers and frac tank transfers.

CTEH® personnel collected real-time and analytical air monitoring data throughout the duration of Phase II and communicated real-time data to CSXT on-site officials for use in decisions regarding safety and operations control. Real-time air monitoring activities were conducted in two distinct zones: community and work area. The work area itself was divided into two separate locations: the transfer operations area and the frac tank staging area at the W.E.L., Inc. facility in Concord, VA. Real-time air monitoring was conducted in both locations of the work area during all stages of transfer operations. Additionally, analytical stations were staged at the perimeter of the derailment site to provide analytical air sampling data throughout transfer operations in the derailment site work area.

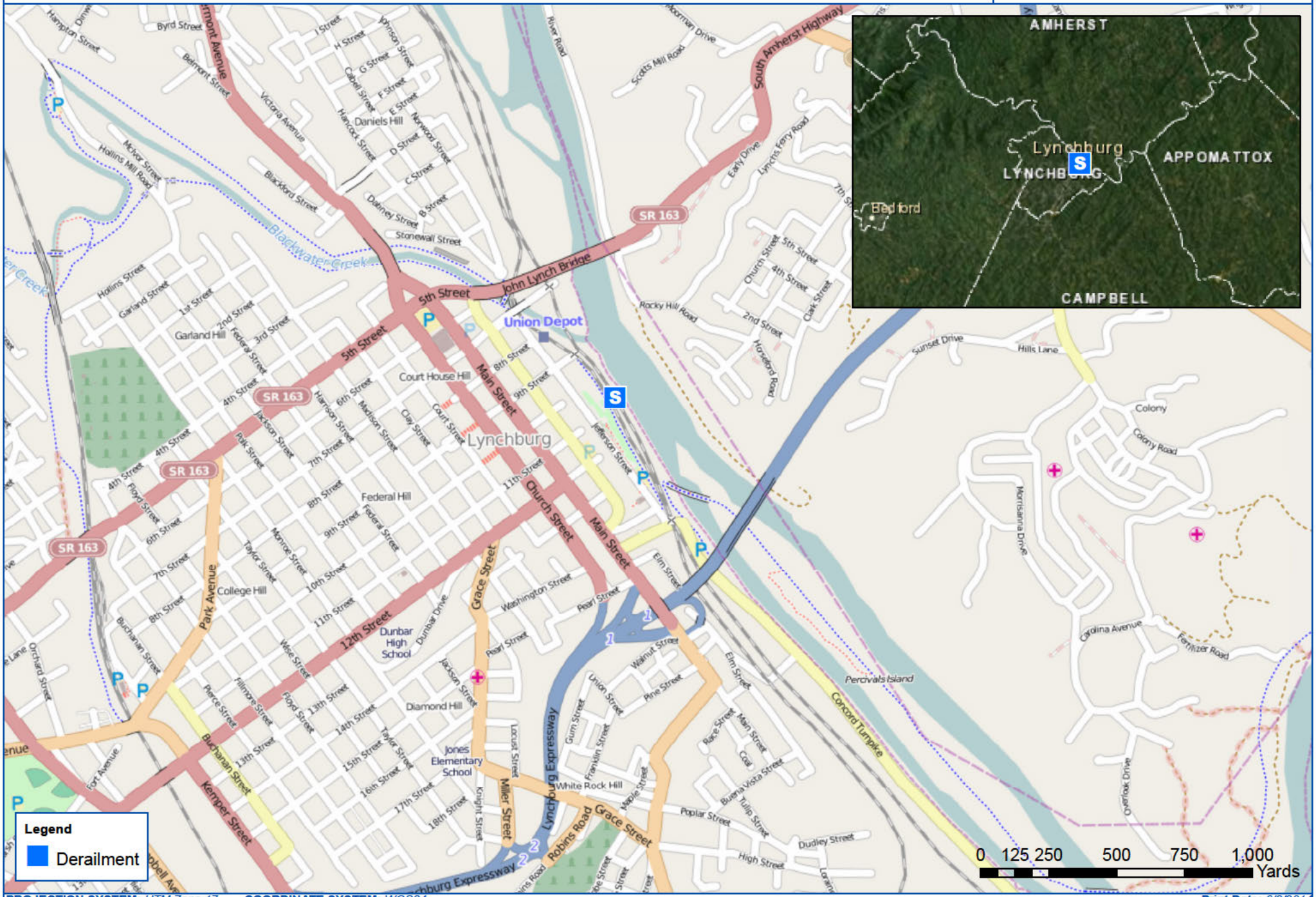
CTEH® air monitoring activities for Phase II in the established work areas and surrounding community concluded on May 8, 2014.

CTEH

Figure 1.1:

Incident Site Location

Project: 106190
Client: CSXT
City: Lynchburg, VA



PROJECTION SYSTEM: *UTM Zone 17* COORDINATE SYSTEM: *WGS84* Print Date: *6/3/2014*

2.0 Air Monitoring and Sampling Strategy

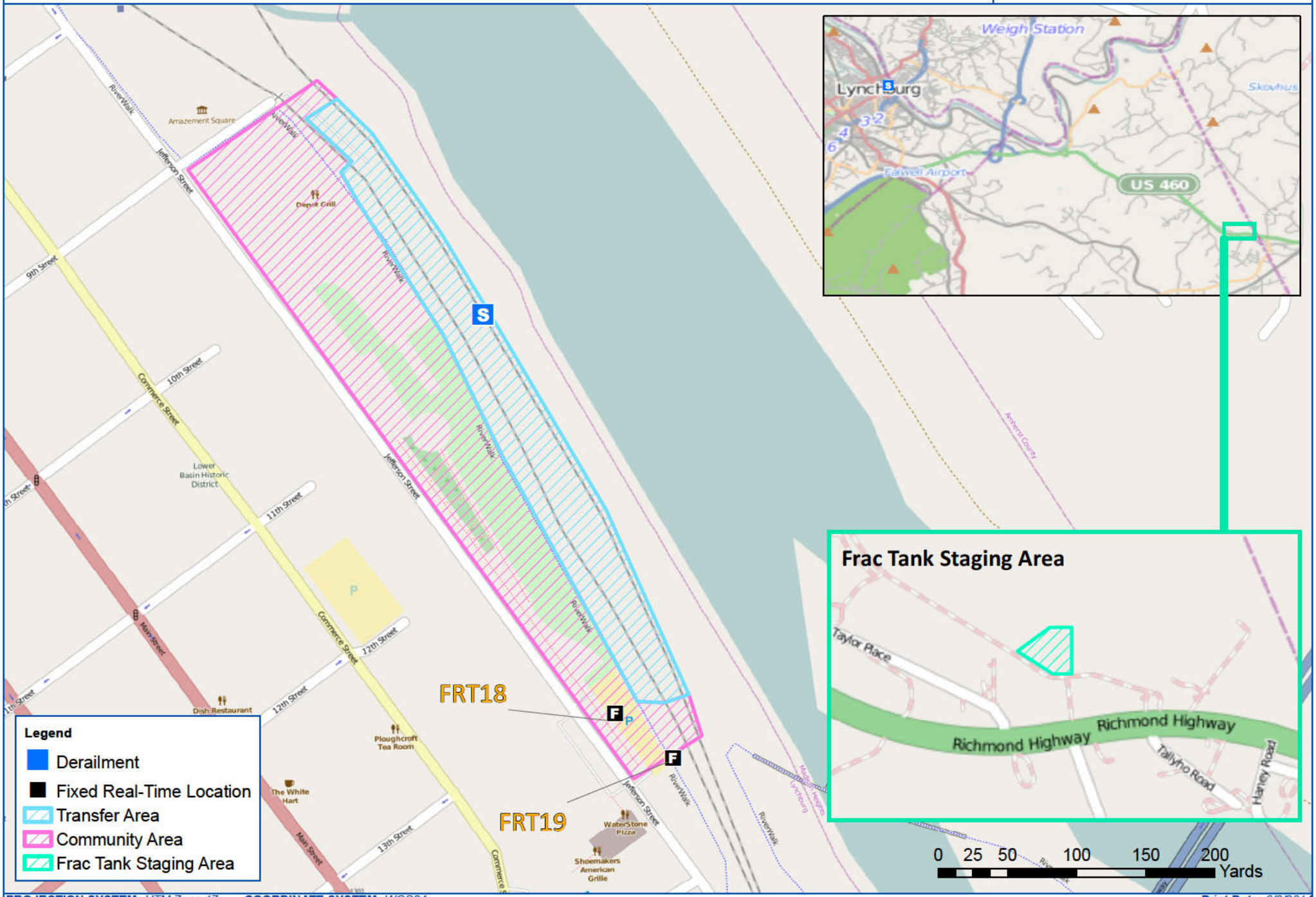
CTEH® provided real-time air monitoring and analytical air sampling for CSXT from May 5, 2014, to May 8, 2014, during Phase II of the Lynchburg crude oil derailment response. Real-time air monitoring was conducted in the work areas and the community throughout all stages of the transfer operations during Phase II. Air monitoring refers to the use of direct-reading instruments that report instantaneous measurements of a substance in real-time. Analytical air sampling was conducted at the perimeter of the derailment site to collect data regarding the presence of crude oil constituents during all stages of transfer in the derailment site work area. Analytical air sampling refers to the collection of discrete quantities of air using containers or chemical-specific media for further analysis in an off-site laboratory.

Air sampling was conducted in two distinct zones: community and work area (**Figure 2.1**). The community was designated as the area immediately surrounding the derailment site work area and was monitored using manually-logged real-time air monitoring instruments. The work areas included both the derailment site work area and the frac tank staging area. Overflow transfers and tank to tank transfers were conducted in the derailment site work area, while frac tank transfers occurred in the frac tank staging area. Within each of these categories, CTEH® personnel conducted air monitoring throughout all transfer activities, including staging, pre-transfer operations, active transfers, and transfer equipment breakdown. The "Transfer Area – Phase II" work plan detailed in the Phase II Air Sampling and Analysis Plan (SAP, see **Appendix A**) was employed in both work areas.

Analytical air sampling was performed to assess the potential presence of airborne chemical constituents associated with crude oil in the work area throughout the duration of transfer operations. Eight analytical stations were established around the perimeter of the derailment site work area (**Figure 2.2**). These stations consisted of an integrated air sample collection device fitted with sorbent tube analytical media #226-01 for the detection of aromatic hydrocarbons and a passive diffusion Organic Vapor Monitor (OVM) badge for the detection of aromatic hydrocarbons. Samples were deployed and analyzed according to NIOSH modified method 1501. The following sections describe the chemicals of interest for the response, their applicable exposure guidelines, and site-specific action levels employed.

Figure 2.1:
Sampling Zone Locations

Project: 106190
Client: CSXT
City: Lynchburg, VA



PROJECTION SYSTEM: *UTM Zone 17* COORDINATE SYSTEM: *WGS84* Print Date: *6/3/2014*

Figure 2.2:
Analytical Air Monitoring Stations

Project: 106190
Client: CSXT
City: Lynchburg, VA

PROJECTION SYSTEM: *UTM Zone 17* COORDINATE SYSTEM: *WGS84* Print Date: *6/3/2014*

2.1 Chemicals of Interest

The chemicals of interest selected during Phase II of the incident response were those determined to have the greatest potential for human health impacts based on the relative levels in air of volatile organics emitted from fresh crude oil (identified as Bakken sweet crude) and/or combustion products, together with published information regarding health-based worker and community exposure guidelines. These chemicals included the volatile organic compounds (VOCs) benzene, toluene, ethyl benzene, xylene, and n-hexane. Hydrogen sulfide (H_2S) was also considered a chemical of interest and was monitored for during Phase II. Additionally, CTEH® personnel monitored for total VOC and flammability as a measure of the Lower Explosive Limit (LEL). There was no visible smoke or fire throughout the duration of Phase II; therefore combustion products were not included as chemicals of interest. Additional information regarding these chemicals of interest can be found in the SAP in **Appendix A.** The MSDS for Bakken sweet crude oil is provided in **Appendix G**.

2.2 Occupational Exposure Standards/Guidelines for Use during Chemical Release Emergencies

The Occupational Safety and Health Administration (OSHA) and The American Conference of Governmental Industrial Hygienists (ACGIH) have established workplace exposure standards and guidelines, respectively. **Table B.1.1** (**Appendix B**) summarizes the worker exposure standards and guidelines for the chemicals of interest. These standards and guidelines are intended for chronic worker exposure occurring over a working lifetime and are therefore, not directly related to the acute types of exposure likely to occur following an accidental chemical release of this type. However, they do provide a valuable standard for reference. A detailed description of occupational and community exposure standards and guidelines is provided in **Appendix B**.

2.3 Community Exposure Guidelines for Use during Chemical Release Emergencies

The U.S. Department of Energy's Subcommittee on Consequence Assessment and Protective Actions (SCAPA) has established Protective Action Criteria (PACs) for over 3,300 chemicals for planning and response to uncontrolled releases of hazardous chemicals. These criteria, combined with estimates of exposure, provide the information necessary to evaluate chemical release events for the purpose of taking appropriate protective actions. During an emergency response, these criteria may be used to evaluate the severity of the event and to inform decision makers regarding what protective actions should be taken. **Table B.2.1** (**Appendix B**) provides the PACs for the chemicals of interest during this response.

2.4 CTEH® Site-Specific Action Levels

CTEH® site-specific action levels were employed in all sampling zones to provide information for corrective action to limit exposure for the chemicals of interest that presented the greatest risk for acute exposure. These values do not replace occupational or community exposure standards or guidelines but are intended to be a concentration limit that triggers an assessment and course of action. CTEH® site-specific action levels for the chemicals of interest and flammability in the work area and community are provided in the SAP (**Appendix A**).

3.0 Air Sampling and Monitoring Methods

CTEH® provided air monitoring and air sampling throughout the duration of Phase II of the project. A preliminary sampling and analysis plan (SAP) was developed based on the initial information available regarding the incident. This plan included site-specific action levels as discussed above with initial sampling and analysis methodology. The Phase II SAP is provided in **Appendix A**. The Phase II SAP includes details regarding the real-time monitoring methods employed, equipment descriptions, and discussion of the analytical sampling methods. **Table 3.0.1** provides a listing of all monitoring equipment and equipment applicability for the chemicals of interest considered in Phase II of the project. **Table 3.0.2** presents the analytical methods used to assess the potential presence of chemicals of interest.

Table 3.0.1 Real-Time Air Monitoring Methods

Real-Time Methods					
Chemical	Instrument	Detection Limit*	Tube#/Lamp	Notes	Correction Factor
VOC	MultiRAE	0.1 ppm	PID 10.6 eV lamp	Measuring range: 0-5,000 ppm	NA
Benzene	UltraRAE	0.05 ppm	PID 9.8 eV lamp	Change SEP tube frequently	NA
	MultiRAE	0.05 ppm	PID 10.6 eV lamp	Measuring range: 0-2,650 ppm	0.53
	Colorimetric	0.05 ppm	Gastec tube #121L	Range: 0.1-10 Volume: 500 mL	1
Toluene	MultiRAE	0.05 ppm	PID 10.6 eV lamp	Measuring range: 0-2,500 ppm	0.5
	Colorimetric	0.5 ppm	Gastec tube #122L	Range: 2-50 Volume: 200 mL	1
Hexane	MultiRAE	0.43 ppm	PID 10.6 eV lamp	Measuring range: 0-21,500 ppm	4.3
	Colorimetric	1 ppm	Gastec tube #102L	Range: 4-50 Volume: 500 mL	1/12
Hydrogen Sulfide	MultiRAE	1 ppm	Sensor	Measuring range: 0-100 ppm	1
	MultiRAE	0.33 ppm	PID 10.6 eV lamp	Measuring range 0-330 ppm	3.3
	Colorimetric	0.1 ppm	Gastec tube #44L	Range: 0.25-2.5 Volume: 1,000 mL	1/10
LEL	MultiRAE	2.5%	Sensor	Measuring range: 0-100%	2.5

*For electronic instruments the detection limit and the range is listed as the resolution adjusted by the correction factor.

Table 3.0.2 Analytical Air Sampling Methods

Analytical Methods				
Analyte	Media	Method	Detection Limit	Target Compounds
BTEX +n-hexane	Sorbent Tube 226-01 Organic Vapor Monitor 3M 3520	Modified NIOSH 1501	Compare to appropriate health based exposure limit	Benzene Ethylbenzene Toluene Xylene Hexane

4.0 Air Sampling and Monitoring Results

Real-time air monitoring and analytical sampling were conducted to provide site management with information regarding the potential for chemical exposures within the general vicinity of the work areas and in the surrounding community as outlined in the SAP. For ease of review, the results from air-monitoring assessments have been grouped according to their location category: work area and community. Additional information is provided in the following appendices:

- Appendix C – Cumulative maps of each analyte
- Appendix D – Complete summaries of each location category
- Appendix E – Analytical data
- Appendix F – Data verification reports
- Appendix G – MSDS for Bakken sweet crude oil

4.1 Community Results

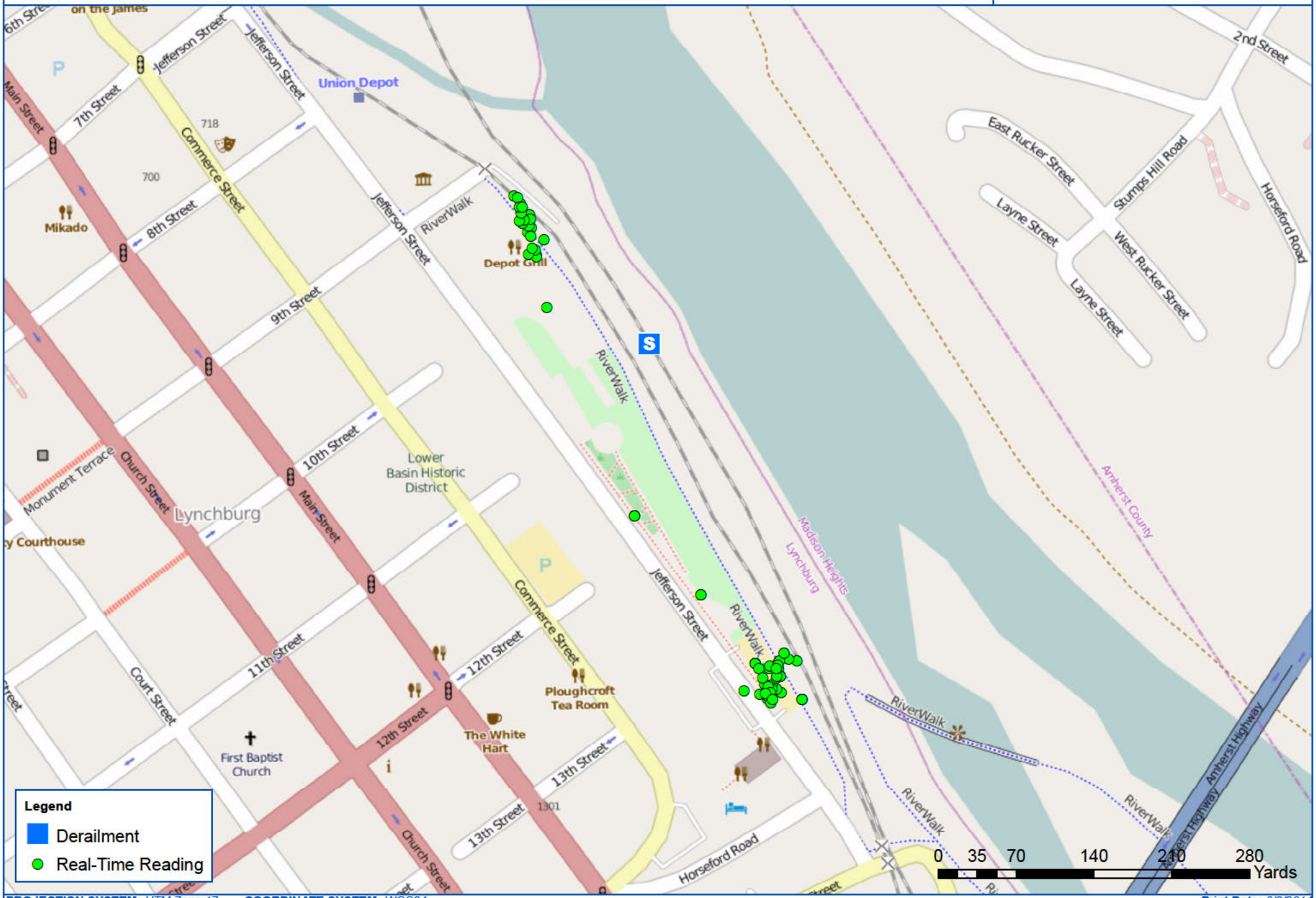
Table 4.1.1 summarizes the readings taken by CTEH® personnel using real-time air monitoring equipment in and around the community immediately surrounding the derailment work area. **Figure 4.1** shows the distribution of readings throughout the community sampling zone. Throughout the duration of Phase II, there were no detections of any chemicals of interest in the community surrounding the transfer area.

Table 4.1.1 Community Manually-Logged Real-Time Summary

Analyte	Number of Readings	Number of Detections	Concentration Range
Benzene	3	0	<0.05 ppm
H_2S	21	0	< 1 ppm
LEL	24	0	< 1%
VOCs	25	0	< 0.1 ppm
Total # of readings	73	0	NA

Figure 4.1:
Community Real-Time Monitoring Distribution

Project: 106190
Client: CSXT
City: Lynchburg, VA



PROJECTION SYSTEM: *UTM Zone 17* COORDINATE SYSTEM: *WGS84* Print Date: *6/3/2014*

4.2 Work Area Results

Table 4.2.1 summarizes the readings taken by CTEH® personnel using real-time air monitoring equipment inside the perimeter of the derailment site work area. **Table 4.2.2** summarizes the readings taken in the frac tank staging area at the W.E.L., Inc. facility throughout the duration of Phase II. **Figure 4.2** illustrates the distribution of manually-logged real-time readings throughout the derailment site work area and the frac tank staging area. Cumulative maps of real-time readings by analyte can be found in **Appendix C**, and complete summaries of each location category can be found in **Appendix D**.

Table 4.2.1 Work Area: Transfer Area Manually-Logged Real-Time Summary

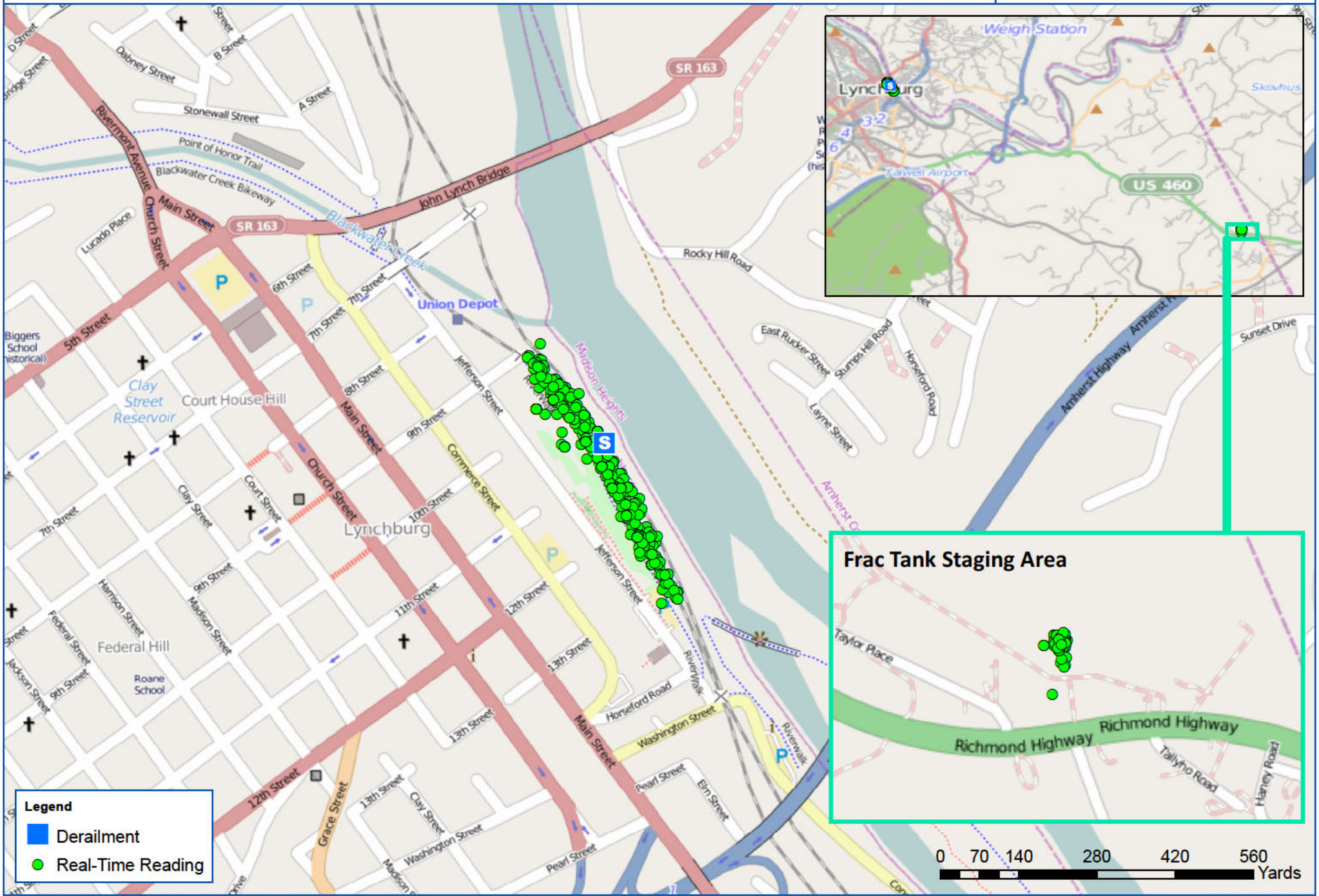
Analyte	Number of Readings	Number of Detections	Concentration Range
Benzene	122	0	< 0.05 ppm
H_2S	287	0	< 1 ppm
LEL	453	0	< 1 %
O_2	4	4	20.9 %
VOCs	478	15	0.1 - 15.7 ppm
Total # of readings	1,344	19	NA

Table 4.2.2 Work Area: Frac Tank Staging Area Manually-Logged Real-Time Summary

Analyte	Number of Readings	Number of Detections	Concentration Range
Benzene	16	3	0.10 - 0.15 ppm
H_2S	65	0	< 1 ppm
LEL	131	5	2 - 7 %
VOCs	136	22	0.2 - 115 ppm
Total # of readings	348	30	NA

Figure 4.2
Work Area Real-Time Monitoring Distribution

Project: 106190
Client: CSXT
City: Lynchburg, VA



PROJECTION SYSTEM: *UTM Zone 17* COORDINATE SYSTEM: *WGS84* Print Date: *6/3/2014*

Table 4.2.3 summarizes the results of integrated air samples for aromatic hydrocarbons collected at analytical stations referenced in **Figure 2.2.** There were no detections of any chemicals of interest for this project in analytical air samples collected throughout the duration of Phase II. Detailed reports of analytical data can be found in **Appendix E.**

Table 4.2.3 Work Area: Transfer Area Analytical Sampling Summary*

Analyte	Number of Samples	Number of Detections	Detection Limit** (ppm)
Sampling Media 226-01			
Benzene	32	0	0.02 - 0.2
Toluene	32	0	0.04 - 0.4
Ethylbenzene	32	0	0.03 - 0.3
Xylene	32	0	0.09 - 0.97
n-Hexane	32	0	0.04 - 0.4
Sampling Media OVM 3520			
Benzene	32	0	0.02 - 0.04
Toluene	32	0	0.05 - 0.09
Ethylbenzene	32	0	0.05 - 0.09
Xylene	32	0	0.14 - 0.28
n-Hexane	32	0	0.05 - 0.09
Total # of sample results	320	0	0.02 – 0.97

*Detailed analytical results can be found in **Appendix E.**
** The range in detection limits is caused by a difference in sample volumes.

5.0 Discussion

Throughout the duration of Phase II, there were no detections of any chemicals of interest in the community immediately surrounding the derailment site transfer area. CTEH® personnel recorded a total of 73 real-time readings in the community area adjacent to the derailment site from May 5, 2014, to May 8, 2014. Of these readings, there were no concentrations of benzene, H_2S, LEL, or total VOCs detected.

In the derailment site transfer area, CTEH® personnel recorded a total of 1,344 real-time readings from May 5, 2014, to May 8, 2014, during the transfer operations of 16 tank cars. There were no sustained VOC detections above the site-specific action levels. There were no concentrations of benzene, H_2S, or LEL detected. Oxygen was detected at normal atmospheric concentrations.

In the frac tank staging area, there were a total of 348 real-time readings collected from May 5, 2014, to May 8, 2014. Benzene detections were below site-specific action levels, and there were no detections of H_2S.

Three instantaneous VOC detections were recorded in the frac tank staging area on May 8, 2014 that exceeded the site-specific action level of 30 ppm; however, these detections were instantaneous and not sustained above the site-specific action level. The concentrations of these detections were 36.4, 37.8, and 115 ppm. Temporary work stoppages and work process adjustments were implemented as protective actions to prevent worker exposure. Following each instantaneous elevated reading, ventilation operations were reassessed and workers were advised to stay upwind of fumes. The highest VOC detection of 115 ppm was still well below the ACGIH TLV-STEL value for gasoline of 500 ppm and the PAC-1 value of 200 ppm and would be unlikely to present serious health risks even if sustained for one hour.

Three LEL detections were recorded during active frac tank transfer operations in the frac tank staging area on May 8, 2014 that exceeded the site-specific action level of 1 %. These readings were sustained above the site-specific action level for approximately one minute each. The concentrations of these detections were 2, 6, and 7 %. Workers were instructed to shut down transfer operations and reassess area ventilation before resuming active transfer operations.

Analytical air sampling was conducted at 8 established air monitoring stations around the perimeter of the derailment site work area from May 5, 2014, to May 8, 2014. A total of 64 analytical air samples were collected throughout the duration of Phase II: 32 sorbent tube air samples and 32 organic vapor monitor samples. There were no measurable detections of benzene, toluene, ethylbenzene, xylene, or n-hexane reported above laboratory detection limits.

The results of real-time and analytical air sampling suggest that there were no airborne crude oil constituents detected at a concentration and duration that would represent a health concern to workers or the public. Based on these results, it is unlikely that site workers and members of the community surrounding the incident were exposed to airborne concentrations of crude oil constituents that would produce adverse health effects during Phase II of the Lynchburg crude oil derailment.

6.0 References

ACGIH. 2014 TLVs and BEIs: Based on the Documentation of the Threshold Limit values for Chemical Substances and Physical Agents and Biological Exposure Indices. Cincinnati, Ohio: American Conference of Governmental Industrial Hygienists; 2014b.

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USEPA. Acute Exposure Guideline Levels: AEGL Chemicals. Washington, DC: U.S. Environmental Protection Agency; 2011. http://www.epa.gov/oppt/aegl/pubs/chemlist.htm

USEPA. Air Quality Index Reporting: Final Rule. Federal Register. 1999 Aug 4; 64(149):42530-42549.

Appendix A

Sampling and Analysis Plan

Incident:	**Lynchburg, VA Crude Oil Incident**
Location:	**Lynchburg, VA**
Client:	**CSX**
Version History:	**1.0**

CTEH® Project-Specific Action Levels

CTEH® project-specific action levels may be employed in all sampling zones to provide information for corrective action to limit exposure. These values do not replace occupational or community exposure standards or guidelines but are intended to be a concentration limit that triggers a course of action to better address worker and public safety. The following chemicals were determined to have the greatest potential for human health impacts based on the relative levels in air of volatile organics emitted from fresh crude oil and/or combustion products, together with published information regarding health-based worker and community exposure guidelines.

Plan/Assignment: **TRANSFER AREA – PHASE II**
Objective: Report air levels before they reach those requiring respiratory protection or other precautionary actions

Analyte	Plan	Action Level	Basis	Action to be Taken
Total VOCs	Work Area	30 ppm	1/10 ACGIH TLV for gasoline – Based on similar concentrations of n-Hexane in automotive gasoline	Report reading to site management, evaluate work practices. If VOC detected, conduct further evaluation.
Benzene	Work Area	0.5 – 2.5 ppm	OSHA PEL Action level – Readings sustained for 15 minutes (STEL is 5 ppm)	Evacuate area or don air purifying respirator; report reading to site management.
Toluene	Work Area	20 ppm	ACGIH® TLV – Reading sustained for 15 minutes	Report reading to site management, evaluate work practices.
Hexane	Work Area	50 ppm	ACGIH® TLV (n-hexane) – Reading sustained for 15 minutes	Report reading to site management, evaluate work practices.
Hydrogen Sulfide	Work Area	1 ppm	ACGIH® TLV – Reading sustained for 15 minutes	Evacuate area, report reading to site management.
Combustion Products*				
Particulate Matter ** ($PM_{2.5}$ or PM_{10})	Work Area	0.150 mg/m^3	WHO guidelines for vegetation fire events – Reading sustained for 15 minutes	Report reading to site management, notify workers of potential for mild aggravation of symptoms.
Particulate Matter ** ($PM_{2.5}$ or PM_{10})	Work Area	0.350 mg/m^3	WHO guidelines for vegetation fire events – Reading sustained for 15 minutes	Recommend respiratory protection for particulate matter (primarily for sensitive individuals).
Carbon Monoxide	Work Area	25 ppm	ACGIH® TLV – Reading sustained for 15 minutes	Report reading to site management, evaluate work practices.
Sulfur Dioxide	Work Area	0.1 ppm	½ ACGIH® STEL – Reading sustained for 15 minutes	Report reading to site management, recommend engineering control if possible.
Sulfur Dioxide	Work Area	0.2 ppm	ACGIH® STEL – Reading sustained for 10 minutes	Evacuate area - Report reading to Site management.
Nitrogen Dioxide	Work Area	0.2 ppm	ACGIH® TLV – Reading sustained for 15 minutes	Report reading to site management, recommend engineering control if possible.
Formaldehyde	Work Area	0.15 ppm	½ ACGIH® Ceiling – Reading sustained for 15 minutes	Report reading to site management, recommend engineering control if possible.

Formaldehyde	Work Area	0.3 ppm	ACGIH® Ceiling – Reading sustained for 1 minute	Evacuate area - Report reading to site management.

*These components will be monitored for if active fire/smoke is visible.
**$PM_{2.5}$ is especially prone to interference from high humidity; in cases of high humidity use PM_{10} impactor which is not as sensitive to humidity

Plan/Assignment: **COMMUNITY**
Objective: Report levels that minimize nuisance levels in the community

Analyte	Plan	Action Level	Basis	Action to be Taken
Total VOCs	Comm.	Detection	Instrument detection limit	Report reading to Project Technical Director
Benzene	Comm.	Detection	Instrument detection limit	Report reading to Project Technical Director
Toluene	Comm.	Detection	Instrument detection limit	Report reading to Project Technical Director
Hexane	Comm.	Detection	Instrument detection limit	Report reading to Project Technical Director
Hydrogen Sulfide	Comm.	Detection	Instrument detection limit	Report reading to Project Technical Director
Combustion Products*				
Particulate Matter ** ($PM_{2.5}$ or PM_{10})	Comm.	0.039 – 0.088 mg/m^3	Wildfire Smoke Guidelines for 1 -3 hr. avg. Moderate AQI	Report reading to site management, evaluate work practices, distribute information about exposure avoidance.
Particulate Matter ** ($PM_{2.5}$ or PM_{10})	Comm.	0.089 – 0.138 mg/m^3	Wildfire Smoke Guidelines for 1 -3 hr. avg. **Unhealthy for Sensitive Groups**	Report reading to site management, if smoke event is projected to be prolonged, notify possible sites for cleaner air shelters.
Carbon Monoxide	Comm.	Detection	Instrument detection limit	Report reading to Project Technical Director
Sulfur dioxide	Comm.	Detection	Instrument detection limit	Report reading to Project Technical Director
Nitrogen Dioxide	Comm.	Detection	Instrument detection limit	Report reading to Project Technical Director
Formaldehyde	Comm.	Detection	Instrument detection limit	Report reading to Project Technical Director

*These components will be monitored for if active fire/smoke is visible.
**$PM_{2.5}$ is especially prone to interference from high humidity: in cases of high humidity use PM_{10} impactor which is not as sensitive to humidity

Plan: **All – FLAMMABILITY**
Objective: Report areas where flammability is most likely

Analyte	Instrument Reading	Corrected Value	Correction Factor	Basis	Action to be Taken
LEL	1 %	2.5 %	2.5 for crude oil LEL*	1% LEL	Egress and notify site management
VOCs	NA	NA	NA For crude oil PID	1% LEL as VOC	Egress and notify site management

*Rough estimate based on common crude oil volatiles

Methods

Real-Time Methods					
Chemical	Instrument	Detection Limit*	Tube#/Lamp	Notes	Correction Factor
VOC	MultiRAE	0.1 ppm	PID 10.6 eV lamp	Measuring range: 0 – 5,000	NA
Benzene	UltraRAE	0.05 ppm	PID 9.8 eV lamp	Change SEP tube frequently (Ben. Cal Gas)	NA
	MultiRAE	0.05 ppm	PID 10.6 eV lamp	Measuring range: 0 – 2,650	0.53
	Colorimetric	0.05 ppm	Gastec tube #121L	Range: 0.1 to 10 Volume: 500 ml	1
Toluene	MultiRAE	0.05 ppm	PID 10.6 eV lamp	Measuring range: 0 – 2,500	0.5
	Colorimetric	0.5 ppm	Gastec tube #122L	Range: 2 to 50 Volume: 200 ml	1
Hexane	MultiRAE	0.43 ppm	PID 10.6 eV lamp	Measuring range: 0 – 21,500	4.3
	Colorimetric	1 ppm	Gastec tube #102L	Range: 4 to 50 Volume: 500 ml	1/12
Hydrogen Sulfide	MultiRAE	1 ppm	Sensor	Measuring range: 0 – 100 ppm	
	MultiRAE	0.33 ppm	PID 10.6 eV lamp	Measuring range: 0 – 330 ppm	3.3
	MultiRAE Pro	0.1 ppm	Sensor	Measuring range: 0 – 100 ppm	
	Colorimetric	0.1 ppm	Gastec tube #4LL	Range:0.25 to 2.5 Volume: 1,000 ml	1/10
LEL	MultiRAE	2.5 %	Sensor	Measuring range: 0 – 100%	2.5
Combustion Products					
PM 2.5/10	SidePak AM510	0.001 mg/m^3	670 nm Laser diode	PM2.5 impactor – 50% cut-off at 2.5 micron PM10 impactor – 50% cut-off at 10 micron	NA
Carbon monoxide	MultiRAE	1 ppm	Sensor	Range: 0 – 500 ppm	
	Colorimetric	0.5 ppm	Gastec tube #1LC	Range: 0 – 30 ppm Volume: 100 ml	1
Sulfur dioxide	MultiRAE	0.1 ppm	Sensor	Range: 0 – 20 ppm	
	Colorimetric	0.05 ppm	Gastec tube #5Lb	Range: 0.05 – 30 ppm Volume: 800 ml	1/4
Nitrogen dioxide	MultiRAE	16 ppm	PID 10.6 eV lamp	Measuring range: 0 – 80,000	16
	MultiRAE	0.1 ppm	Sensor	Range: 0 – 20 ppm	
	Colorimetric	0.1 ppm	Gastec tube #9L	Range: 0.5 – 0.1 ppm Volume: 200 ml	1
Formaldehyde	Colorimetric	0.05 ppm	Gastec tube #91L	Range: 0.1 – 5 ppm Volume: 500 ml	1

*For electronic instruments the detection limit and range is listed as the resolution adjusted by the correction factor.

Analytical Methods				
Analyte	Media	Method	Detection Limit	Target compounds
BTEX (+Hexane)	226-01	Modified NIOSH 1500/1501	Compare to appropriate health based exposure limit	Benzene, Toluene, Ethylbenzene, Xylene, Hexane.

General Information on Procedures (Assessment Techniques) Used

Procedure	Description
Hand-held Survey	CTEH staff members may utilize handheld instruments (e.g. MultiRAE Plus; ppbRAE, Gastec colorimetric detector tubes, etc.) to measure airborne chemical concentrations. CTEH will use these hand-held instruments primarily to measure the breathing zone. Additionally, measurements can be made at grade level, as well as in elevated workspaces, as indicated by chemical properties or site conditions.
Analytical sampling	Analytical sampling may be used to validate the hand-held data monitoring data, or to provide data beyond the scope of the real-time instruments. Analytical samples may be collected as whole air samples in evacuated canisters or on specific collection media, and sent to an off-site laboratory for further chemical analysis.

Sampling Areas

Sampling Area	Description
Transfer Area	The general area around the area where contents of the affected tank cars will be transferred.
Community	The general area around the transfer location where individuals not participating in remediation activities could potentially be exposed to the crude oil being transferred.
Other	During the course of the transfer, some additional areas or specific tasks may require a unique set of action levels or sampling (e.g. decontamination zones, commercial zones, etc.)

Quality Assurance/Quality Control Procedures

Method	Procedure
Real-time	• Real time instruments may be calibrated in excess of the manufacturer's recommendations. ○ At a minimum whenever indicated by site conditions or instrument readings. • Co-located sampling for analytical analysis may be conducted, if necessary, to assess accuracy and precision in the field. • Lot numbers and expiration dates may be recorded with use of Gastec colorimetric tubes.
Analytical	• Chain of custody documents may be completed for each sample. • Level II data validation may be performed on 20% of all samples. • Level IV data validation may be performed on 10% of all samples.
Other	

Change from version 1.0 to 1.1
• *In the section titled:*

	Name/Position	Signature	Date Signed
Prepared By:	David Cawthon/Project Toxicologist	[redacted]	5/1/14

Appendix B

Exposure Guidelines and Standards

B. Exposure Guidelines and Standards

Various government agencies and professional organizations have developed exposure guidelines specific for the chemicals of interest in the workplace and for the general public. These are health-protective values developed to protect workers and the general public from overexposures.

B.1 Occupational and Community Exposure Standards/Guidelines

The Occupational Safety and Health Administration (OSHA) and The American Conference of Governmental Industrial Hygienists (ACGIH) have established workplace exposure standards and guidelines, respectively. **Table B.1.1** summarizes the worker exposure standards and guidelines for the chemicals of interest.

Table B.1.1 Occupational Exposure Standards and Guidelines

Analyte	ACGIH (ppm)		OSHA (ppm)	
	TLV-TWA[a]	TLV-STEL[b]	PEL-TWA[c]	PEL-C[d]
Total VOC (as gasoline)	300	500	NE	NE
Benzene	0.5	2.5	1	5
Toluene	20	NE	200	300, 500**
Ethylbenzene	20	125	100	NE
Xylene	100	150	100	NE
n-Hexane	50	NE	500	NE
Hydrogen Sulfide	1	5	NE	20, 50**

**10-minute peak per 8-hour shift

NE = Not Established

a. ACGIH TLV-TWA = Threshold Limit Value – Time Weighted Average (TLV-TWA). The TWA concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may repeatedly be exposed, day after day, without adverse effect (ACGIH, 2014b).

b. ACGIH TLV-STEL = Threshold Limit Value – Short Term Exposure Limit (TLV-STL). A 15 minute TWA exposure that should not be exceeded at any time during a workday, even if the 8-hour TWA is within the TLV-TWA. The TLV-STEL is the concentration to which it is believed that workers can be exposed continuously for a short period of time without suffering from 1) irritation, 2) chronic or irreversible tissue damage, 3) dose-rate dependent toxic effects, or 4) narcosis of sufficient degree to increase the likelihood of accidental injury, impaired self-rescue, or materially reduced work efficiency. Exposures above the TLV-TWA up to the TLV-STEL should be less than 15 minutes, should not occur more than 4 times per day, and there should be at least 60 minutes between successive exposures in this range (ACGIH, 2014b).

c. OSHA PEL-TWA = Permissible Exposure Limit – Time Weighted Average (PEL-TWA). Permissible concentration in the air of a substance that shall not be exceeded in any 8-hour work shift of a 40-hour work week (OSHA 29 CFR: 1910.1000).

d. OSHA PEL-C = Permissible Exposure Limit – Ceiling (PEL-C). The exposure limit that shall at no time be exceeded. If instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute time weighted average exposure, which shall not be exceeded at any time during the working day (OSHA 29 CFR: 1910.1000).

B.2 Community Exposure Guidelines for Use during Chemical Release Emergencies

The U.S. Department of Energy's Subcommittee on Consequence Assessment and Protective Actions (SCAPA) has established Protective Action Criteria (PACs) for over 3,300 chemicals for planning and response to uncontrolled releases of hazardous chemicals. These criteria, combined with estimates of exposure, provide the information necessary to evaluate chemical release events for the purpose of taking appropriate protective actions. During an emergency response, these criteria may be used to evaluate the severity of the event and to inform decisions regarding what protective actions should be taken.

PAC values are based on the following exposure limit values:

- Acute Exposure Guideline Level (AEGL) values published by the U.S. Environmental Protection Agency (EPA)
- Emergency Response Planning Guideline (ERPG) values provided by the American Industrial Hygiene Association (AIHA)
- Temporary Emergency Exposure Limit (TEEL) values developed by SCAPA

For any particular chemical, the following hierarchy is used to establish its PAC:

- Use AEGLs (including final or interim values) if they are available.
- If AEGLs are not available, use ERPGs.
- If neither AEGLs or ERPGs are available, use TEELs.

AEGLs, ERPGs, and TEELs have three common benchmark values for each chemical. Each successive benchmark is associated with an increased severity of potential effect(s) associated with exposure to the specified level. The three benchmarks present estimated threshold levels for:

- Mild, transient health effects.
- Irreversible or other serious health effects that could impair the ability to take protective action.
- Life-threatening health effects.

Table B.2.1 provides the PACs for the chemicals of interest during this response.

Table B.2.1 Protective Action Criteria*

Chemical	PAC-1 (ppm)	PAC-2 (ppm)	PAC-3 (ppm)
Total VOC (as gasoline)	200	1,000	4,000
Benzene	52	800	4000
Toluene	200	1200	4500
Ethylbenzene	33	1100	1800
Xylene	130	920	2,500
n-Hexane	300**	3300	8600
Hydrogen Sulfide	0.51	27	50

*PAC values correspond to 60-minute AEGL values.

**Due to insufficient and animal data addressing the level of effects defined by AEGL-1, no AEGL-1 values are recommended for hexane. Alternatively, hexane PAC-1 is derived from the TEEL values.

a. PAC-1 is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic, nonsensory effects. However, these effects are not disabling and are transient and reversible upon cessation of exposure (DOE/SCAPA, 2012).

b. PAC-2 is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, longlasting, adverse health effects or an impaired ability to escape (DOE/SCAPA, 2012).

c. PAC-3 is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening adverse health effects or death (DOE/SCAPA, 2012).

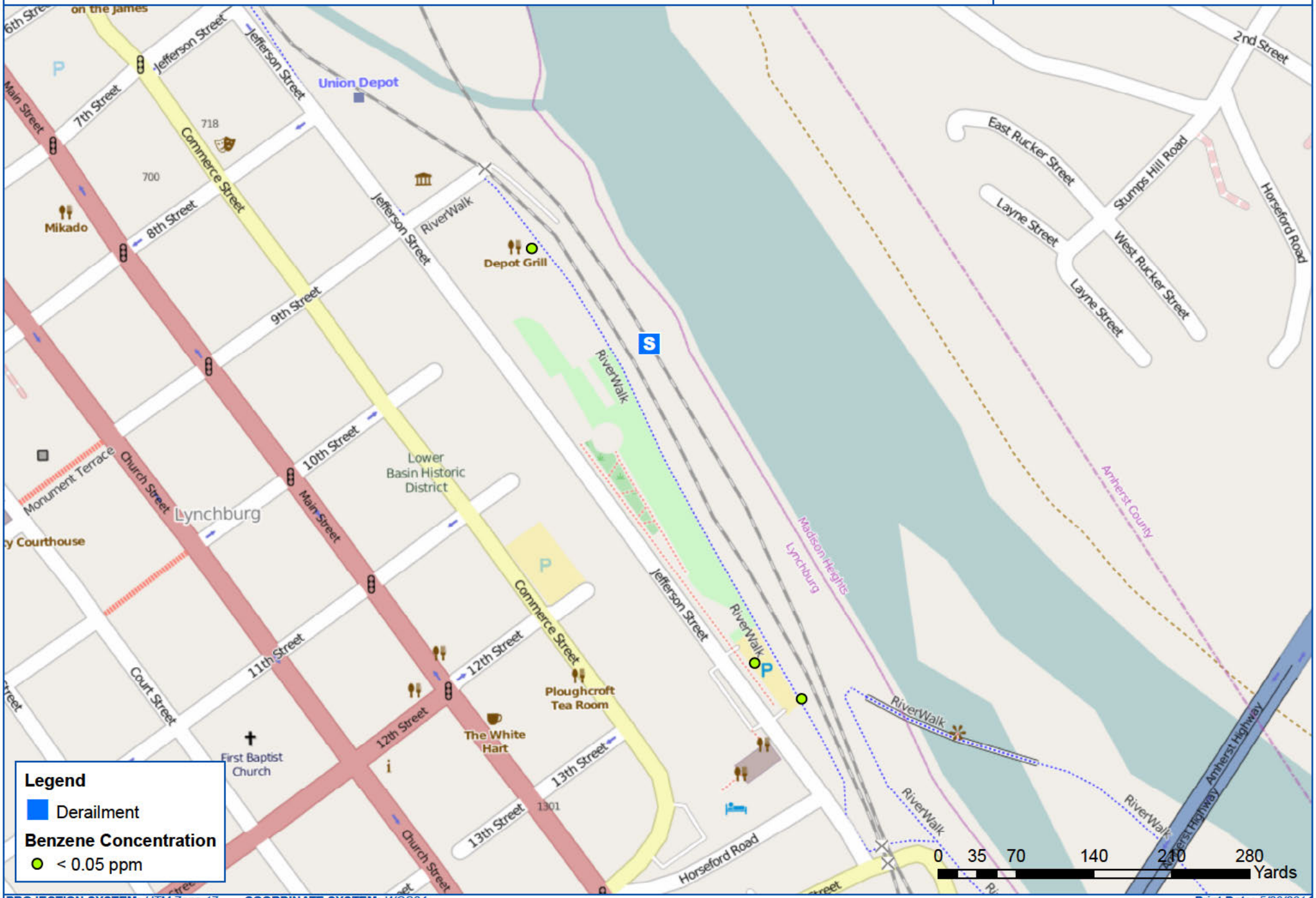
Appendix C

Cumulative Maps of Manually-Logged Real-Time Data Locations by Analyte

Lynchburg, VA Derailment

Community Benzene Real-Time Monitoring Locations between May 5, 2014 00:00 and May 9, 2014 00:00

Project: 106190
Client: CSXT
City: Lynchburg, VA

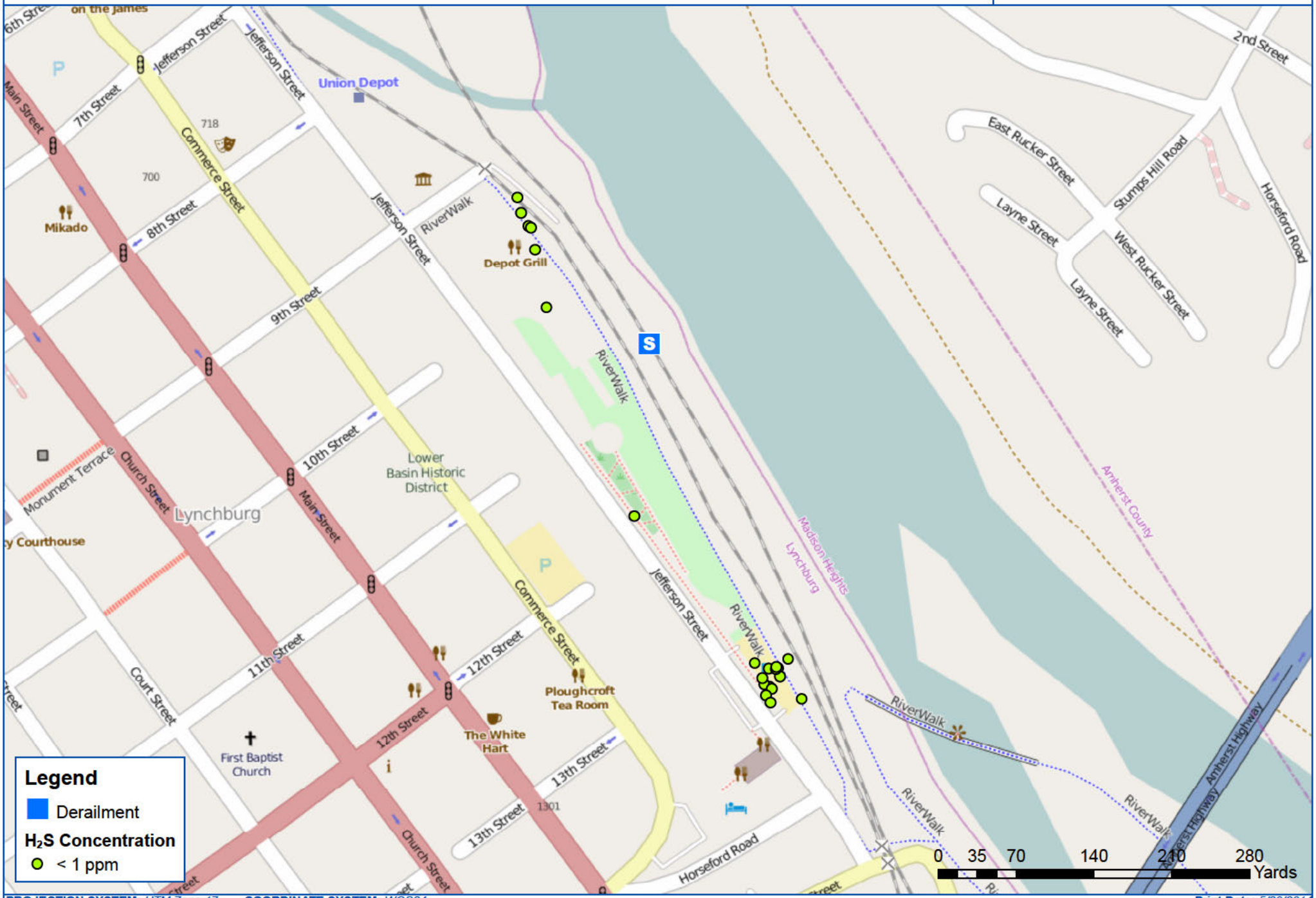


PROJECTION SYSTEM: *UTM Zone 17* COORDINATE SYSTEM: *WGS84* Print Date: *5/30/2014*

Lynchburg, VA Derailment

Community H_2S Real-Time Monitoring Locations between May 5, 2014 00:00 and May 9, 2014 00:00

Project: 106190
Client: CSXT
City: Lynchburg, VA

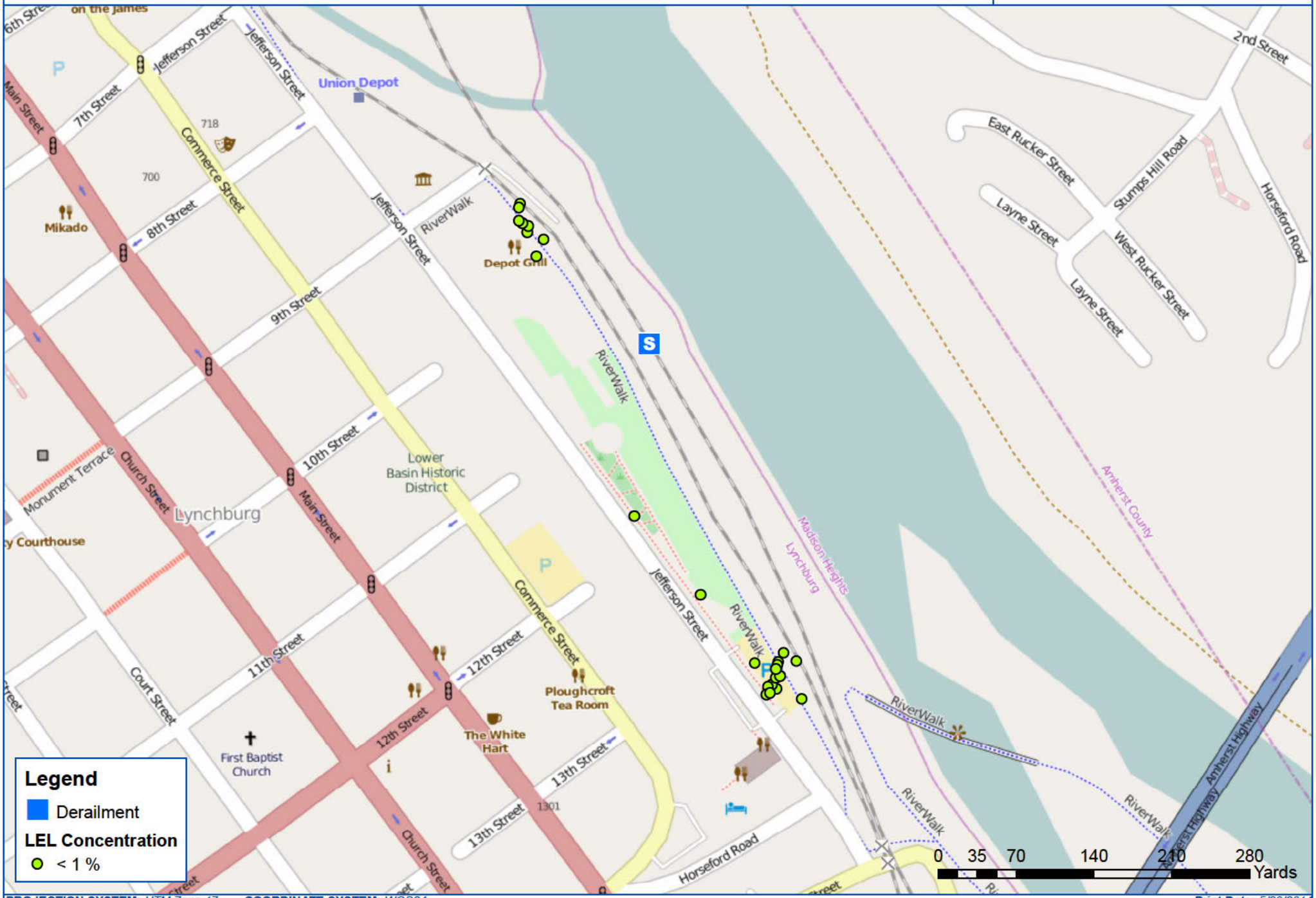


PROJECTION SYSTEM: *UTM Zone 17* COORDINATE SYSTEM: *WGS84* Print Date: *5/30/2014*

Lynchburg, VA Derailment

Community LEL Real-Time Monitoring Locations between May 5, 2014 00:00 and May 9, 2014 00:00

Project: 106190
Client: CSXT
City: Lynchburg, VA

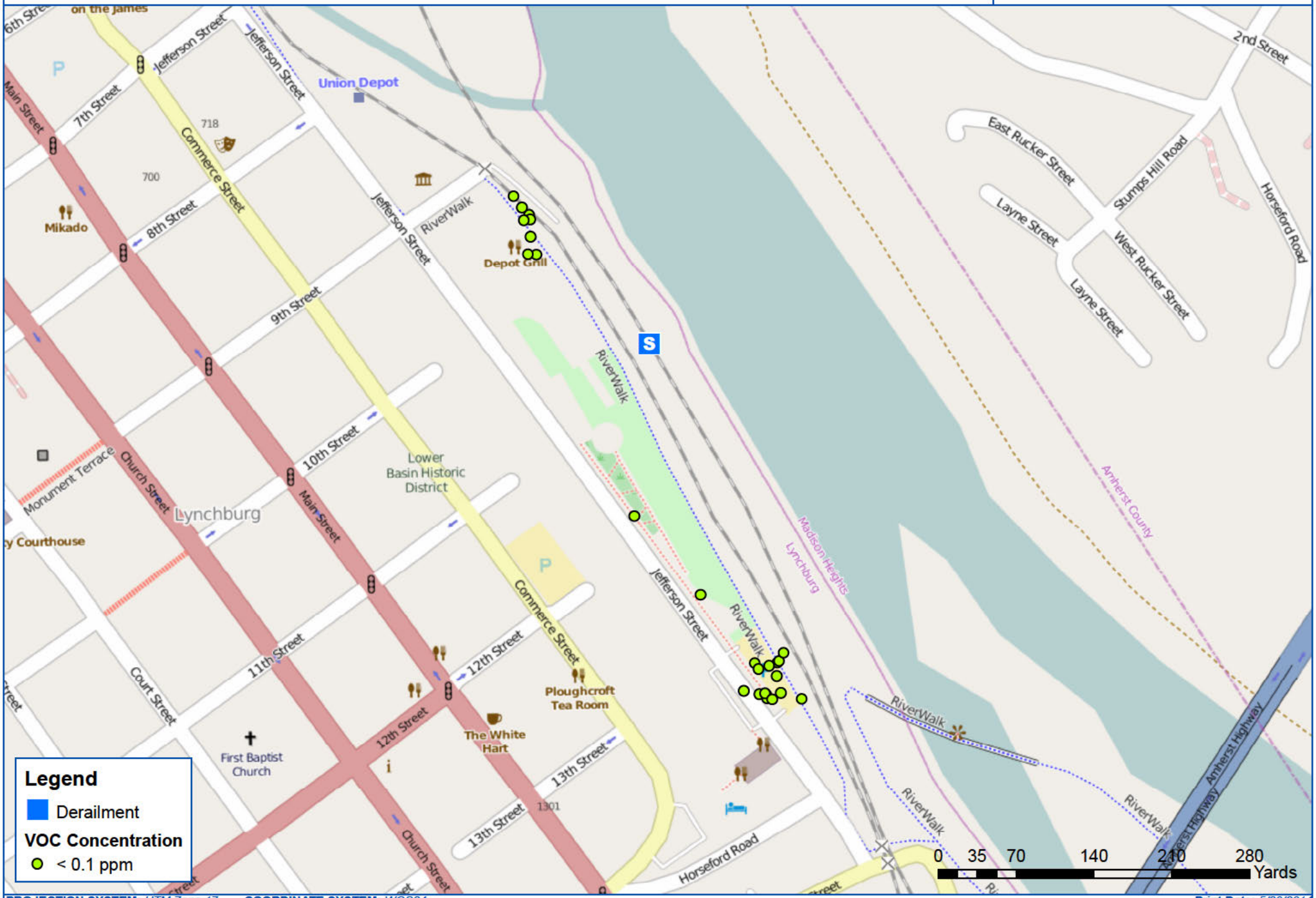


PROJECTION SYSTEM: *UTM Zone 17* COORDINATE SYSTEM: *WGS84* Print Date: *5/30/2014*

Lynchburg, VA Derailment

Community VOC Real-Time Monitoring Locations between May 5, 2014 00:00 and May 9, 2014 00:00

Project: 106190
Client: CSXT
City: Lynchburg, VA

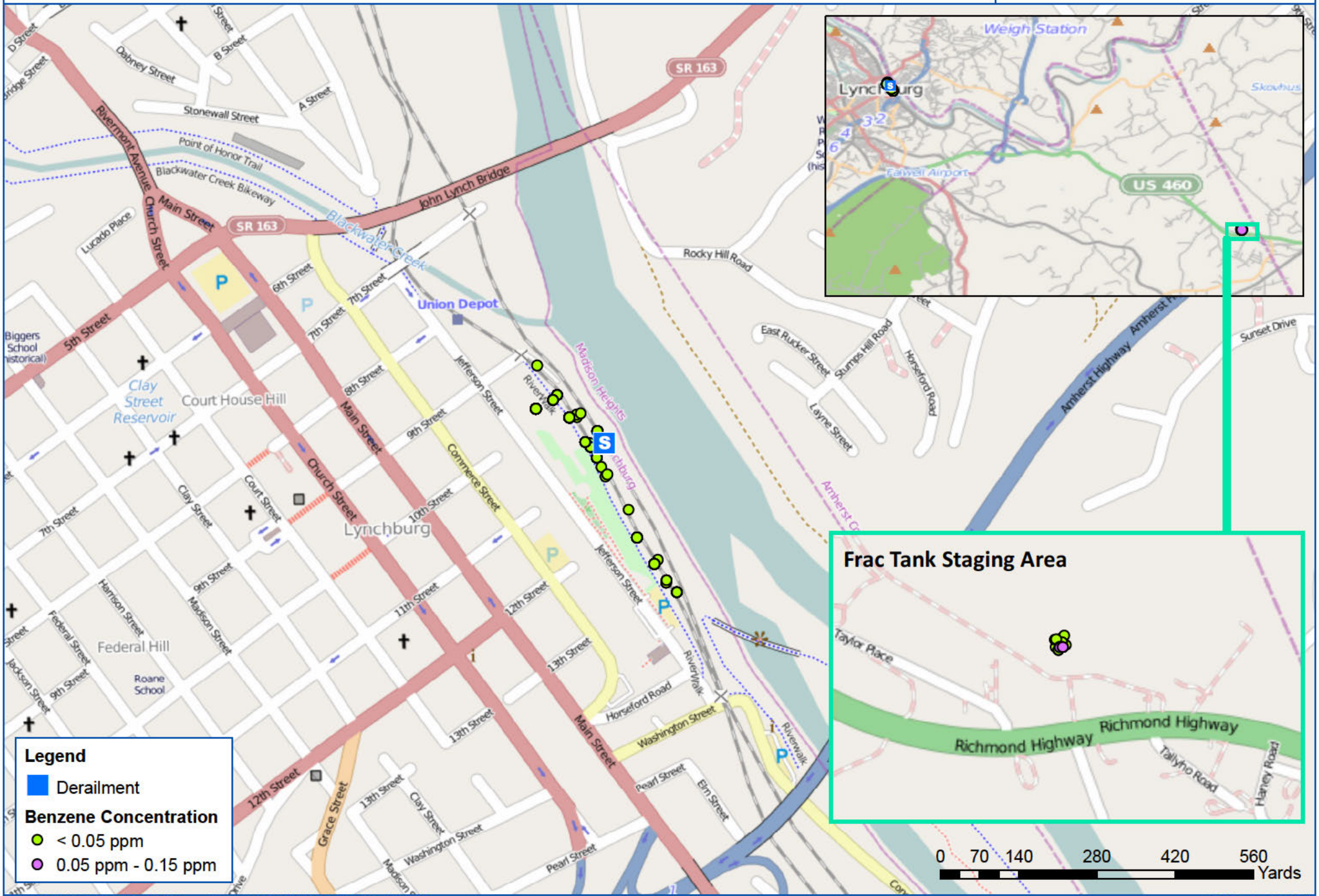


PROJECTION SYSTEM: *UTM Zone 17* COORDINATE SYSTEM: *WGS84* Print Date: *5/30/2014*

Lynchburg, VA Derailment

Work Area Benzene Real-Time Monitoring Locations between May 5, 2014 00:00 and May 9, 2014 00:00

Project: 106190
Client: CSXT
City: Lynchburg, VA



Legend

- Derailment

Benzene Concentration

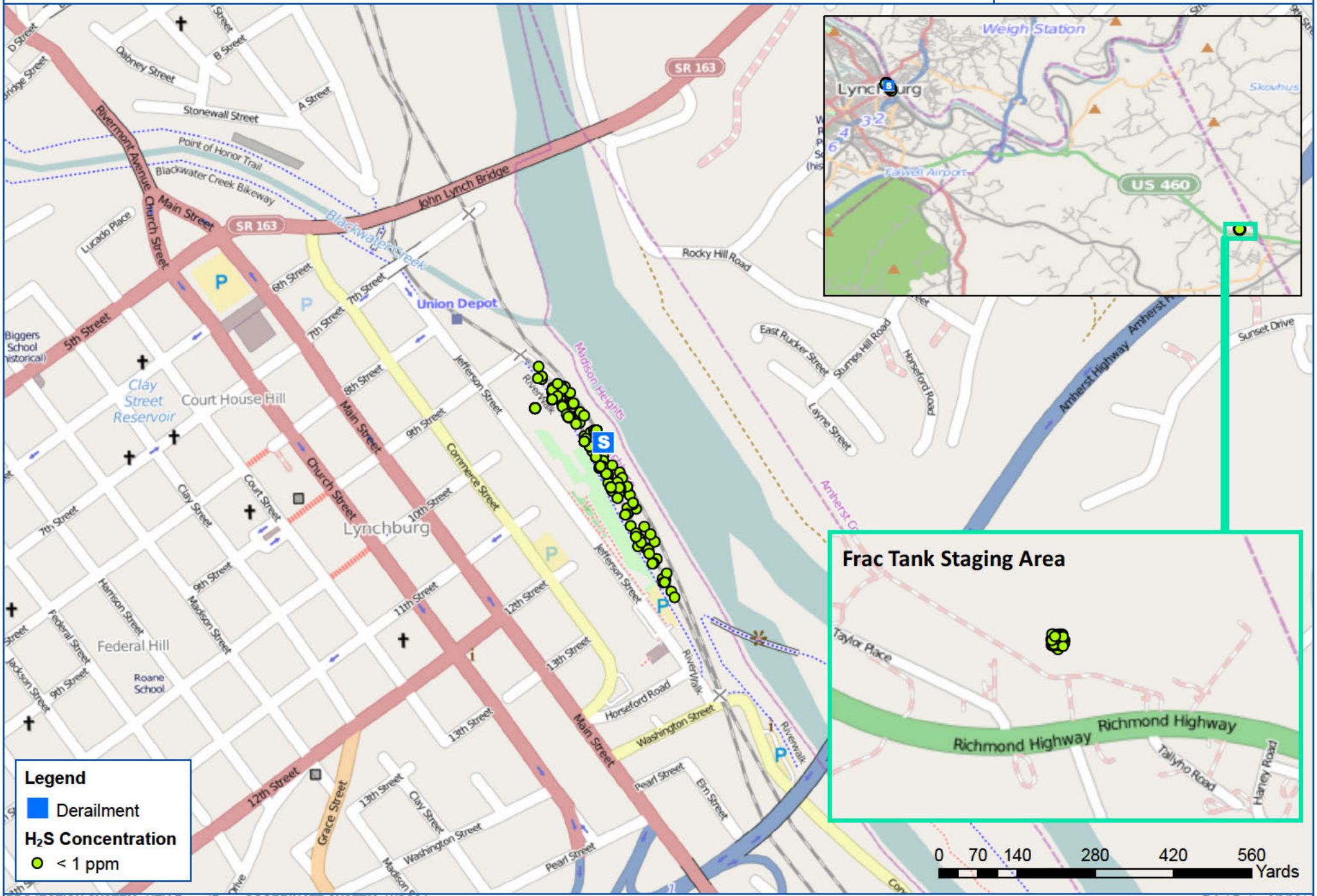
- < 0.05 ppm
- 0.05 ppm - 0.15 ppm

PROJECTION SYSTEM: *UTM Zone 17* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *6/2/2014*

Lynchburg, VA Derailment

Work Area H_2S Real-Time Monitoring Locations between May 5, 2014 00:00 and May 9, 2014 00:00

Project: 106190
Client: CSXT
City: Lynchburg, VA

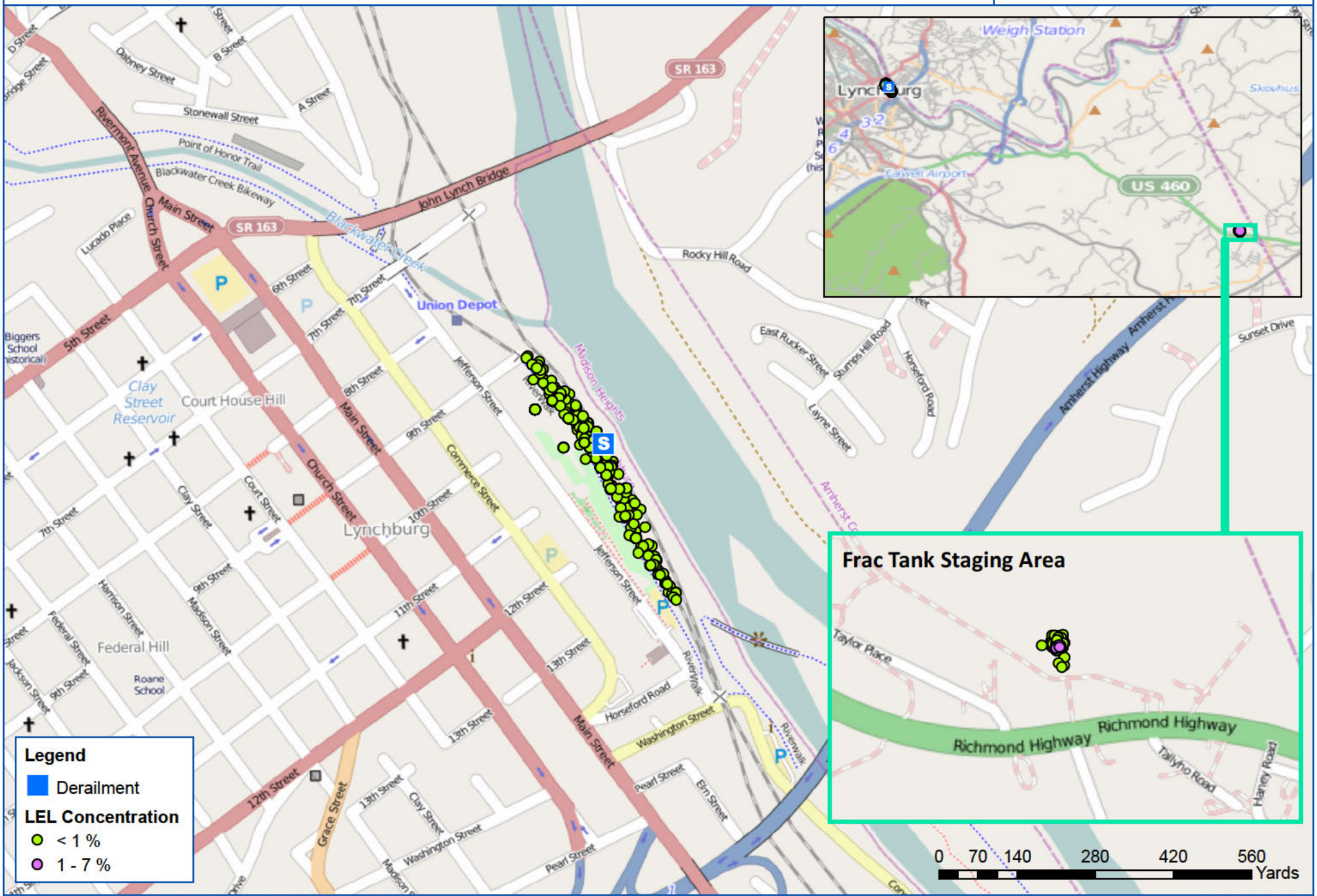


PROJECTION SYSTEM: *UTM Zone 17* COORDINATE SYSTEM: *WGS84* Print Date: *6/2/2014*

Lynchburg, VA Derailment

Work Area LEL Real-Time Monitoring Locations between May 5, 2014 00:00 and May 9, 2014 00:00

Project: 106190
Client: CSXT
City: Lynchburg, VA

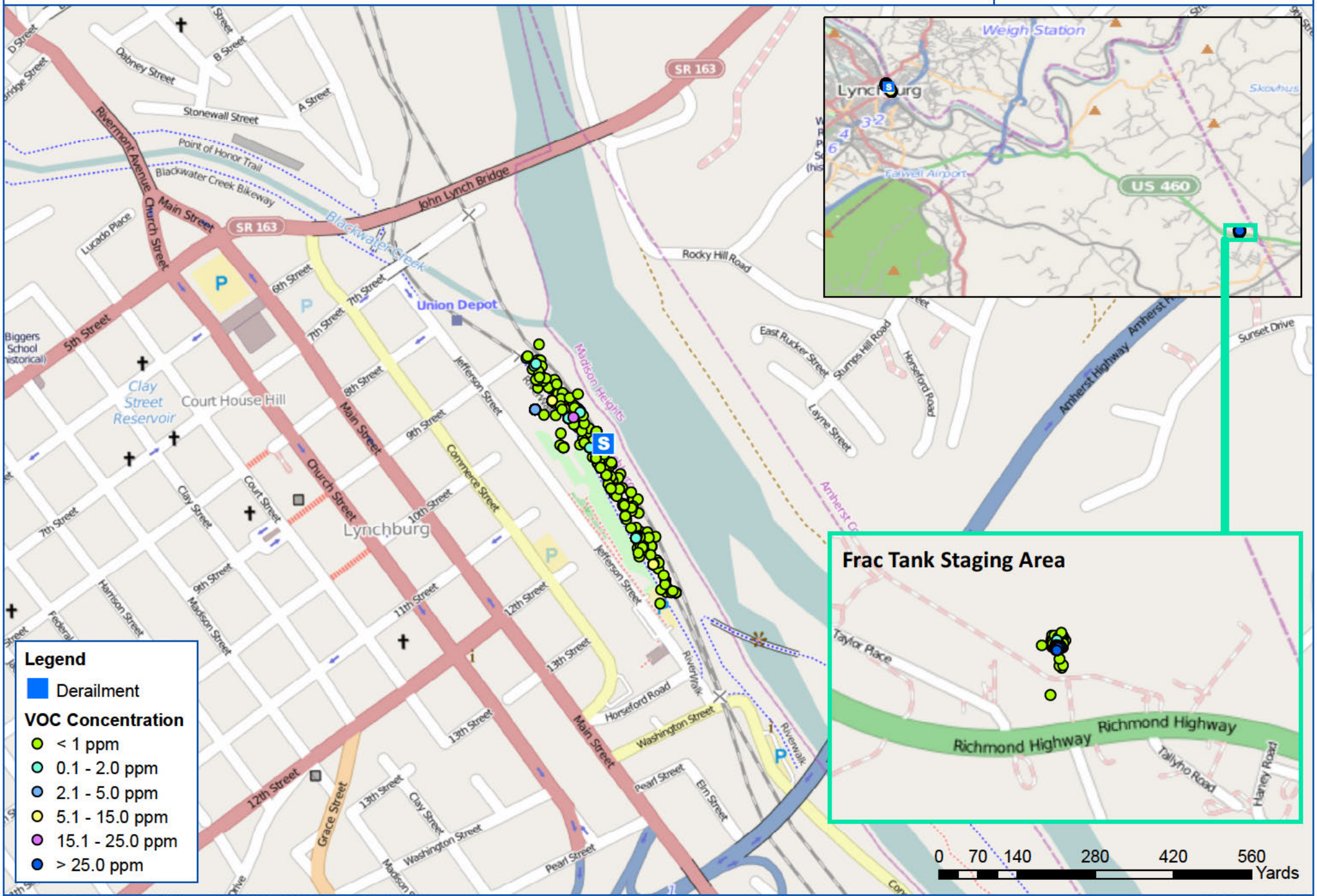


PROJECTION SYSTEM: *UTM Zone 17* COORDINATE SYSTEM: *WGS84* Print Date: *6/2/2014*

Lynchburg, VA Derailment

Work Area VOC Real-Time Monitoring Locations between May 5, 2014 00:00 and May 9, 2014 00:00

Project: 106190
Client: CSXT
City: Lynchburg, VA



PROJECTION SYSTEM: *UTM Zone 17* COORDINATE SYSTEM: *WGS84* Print Date: *6/2/2014*

Appendix D

Summaries of Location Categories

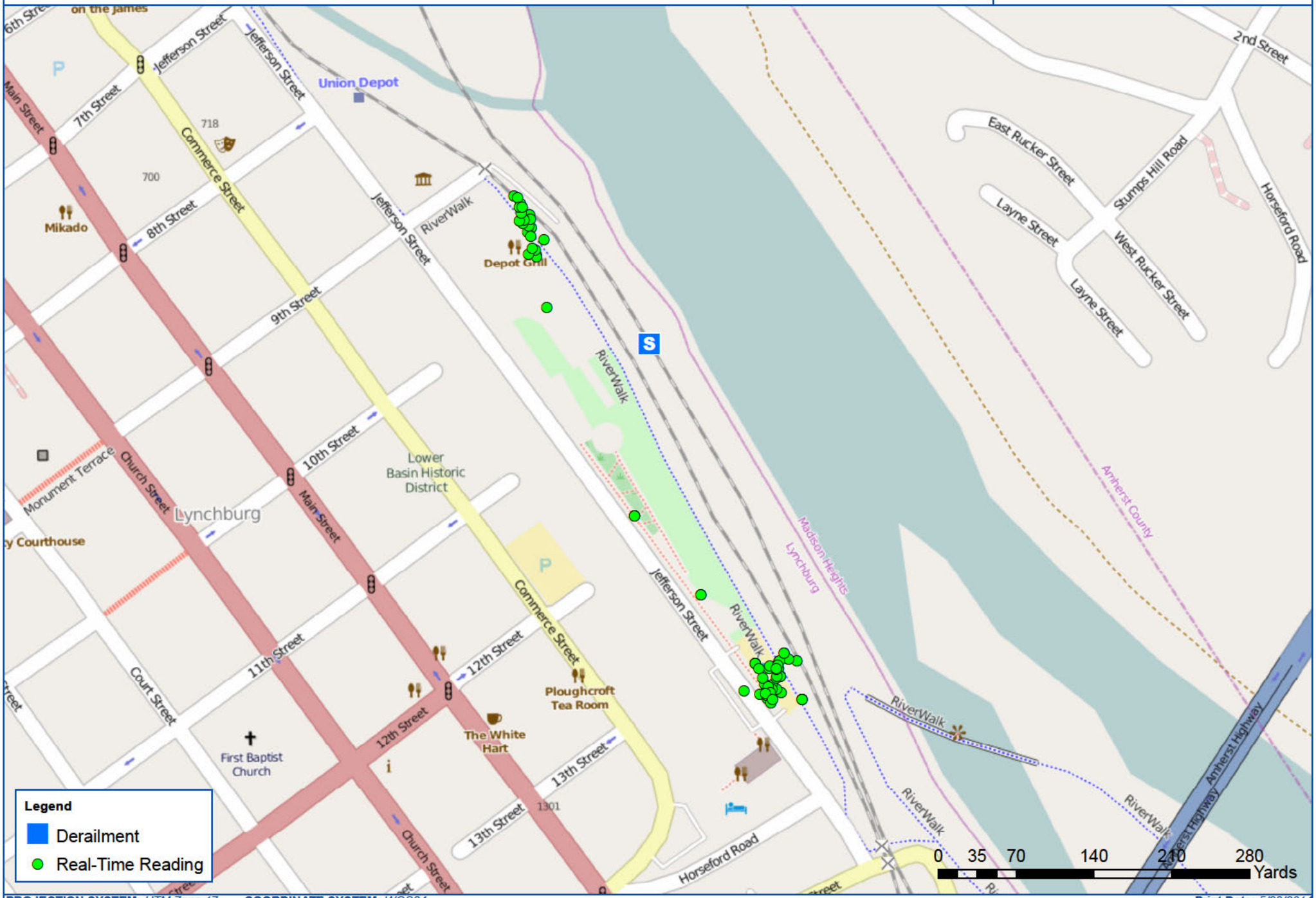
Table D.1 Real-Time Air Monitoring Summaries of Location Categories

Location Category	Analyte	Total Number of Readings	Total Number of Detections	Detection Concentration Range
Community	VOCs	25	0	< 0.1 ppm
	Benzene	3	0	<0.05 ppm
	H_2S	21	0	< 1 ppm
	LEL	24	0	< 1%
Work Area Frac Tank Staging Area	Benzene	16	3	0.1 - 0.15 ppm
	H_2S	65	0	< 1 ppm
	LEL	131	5	2 - 7 %
	VOC	136	22	0.2 - 115 ppm
Work Area Transfer Area Operations	Benzene	122	0	< 0.05 ppm
	H_2S	287	0	< 1 ppm
	LEL	453	0	< 1 %
	O_2	4	4	20.9 %
	VOC	478	15	0.1 - 15.7 ppm

Lynchburg, VA Derailment

Community Real-Time Monitoring Locations between May 5, 2014 00:00 and May 9, 2014 00:00

Project: 106190
Client: CSXT
City: Lynchburg, VA

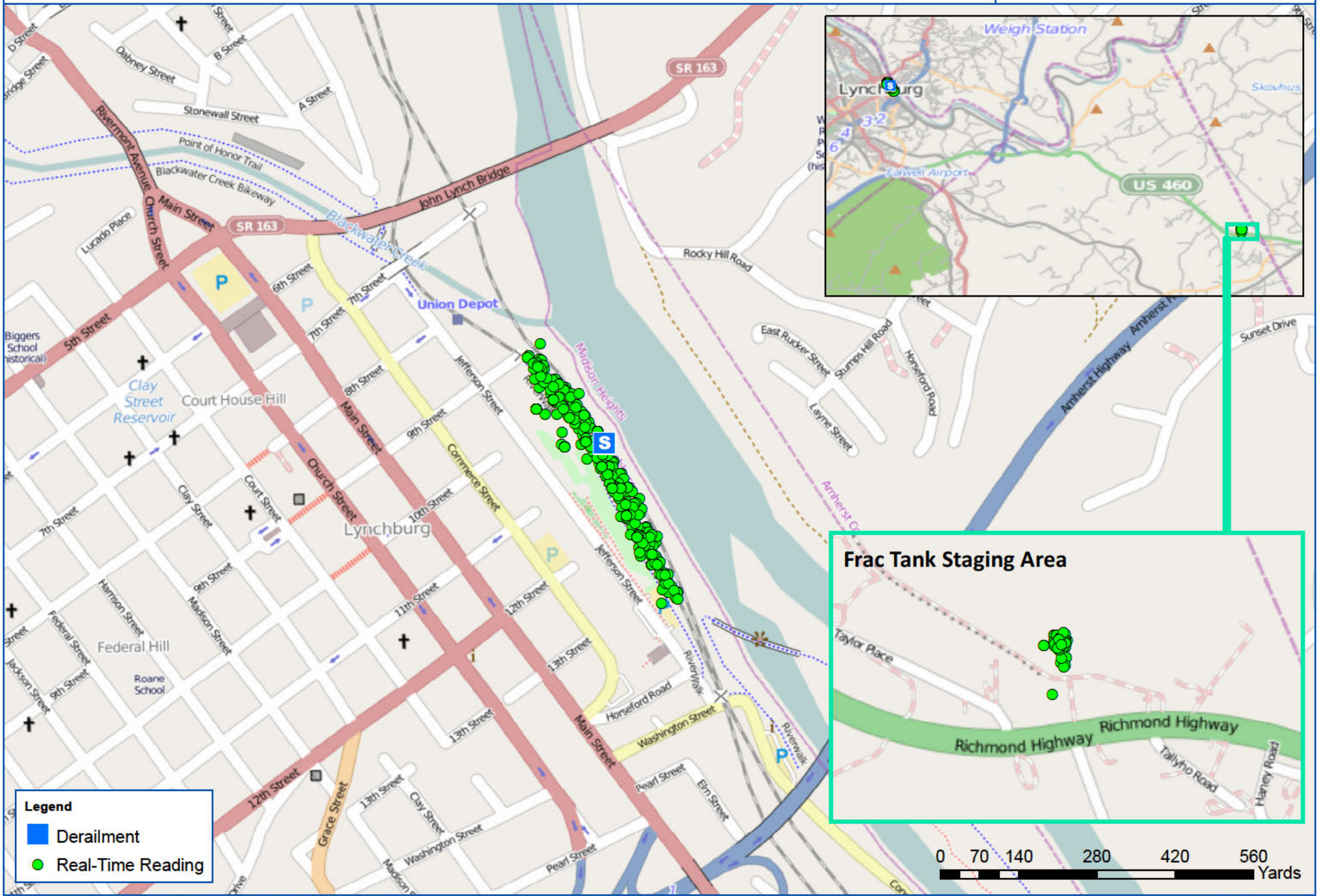


PROJECTION SYSTEM: *UTM Zone 17* COORDINATE SYSTEM: *WGS84* Print Date: *5/23/2014*

Lynchburg, VA Derailment

Work Area Real-Time Monitoring Locations between May 5, 2014 00:00 and May 9, 2014 00:00

Project: 106190
Client: CSXT
City: Lynchburg, VA



PROJECTION SYSTEM: *UTM Zone 17* COORDINATE SYSTEM: *WGS84*

Print Date: *5/23/2014*

Lynchburg, VA Derailment

North Side Transfer Area Real-Time Monitoring Locations between May 5, 2014 00:00 and May 9, 2014 00:00

Project: 106190
Client: CSXT
City: Lynchburg, VA

PROJECTION SYSTEM: *UTM Zone 17* COORDINATE SYSTEM: *WGS84* Print Date: *6/9/2014*

Lynchburg, VA Derailment

South Side Transfer Area Real-Time Monitoring Locations between May 5, 2014 00:00 and May 9, 2014 00:00

Project: 106190
Client: CSXT
City: Lynchburg, VA

PROJECTION SYSTEM: *UTM Zone 17* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *6/9/2014*

Appendix E

Analytical Data

Mr. JT Wilson
Center for Toxicology & Env. Health LLC
2000 Anders Lane
Kemah, TX 77565

May 19, 2014

Lynchburg, VA

DOH ELAP #11626
AIHA-LAP #100324

Account# 15330

Login# L318349

Dear Mr. Wilson:

Enclosed are the analytical results for the samples received by our laboratory on May 12, 2014. 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. Unless otherwise requested, all samples will be discarded 14 days from the date of this report, with the exception of IOMs, which will be cleaned and disposed of after seven calendar days.

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

Please contact Caroline Hudson 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)

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

LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832231

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505NF5700 **Lab ID : L318349-10** **Time : 885 Minutes**
Date Sampled : 05/05/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.06	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.64	<0.15

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

LABORATORY ANALYSIS REPORT

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

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832231

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505NF5709 **Lab ID : L318349-11** **Time : 840 Minutes**
Date Sampled : 05/05/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.67	<0.16

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

LABORATORY ANALYSIS REPORT

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

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832231

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505NF5640 **Lab ID : L318349-12** **Time : 827 Minutes**
Date Sampled : 05/05/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.68	<0.16

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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www.galsonlabs.com

LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832231

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505NF5773 **Lab ID : L318349-13** **Time : 820 Minutes**
Date Sampled : 05/05/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.69	<0.16

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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FAX: (315) 437-0571
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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832231

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505NF6028 **Lab ID : L318349-14** **Time : 900 Minutes**
Date Sampled : 05/05/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.06	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.63	<0.15

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

LABORATORY ANALYSIS REPORT

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

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832231

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505NF5655 **Lab ID : L318349-15** **Time : 904 Minutes**
Date Sampled : 05/05/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.06	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.63	<0.14

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832231

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505NF6022 **Lab ID : L318349-16** **Time : 850 Minutes**
Date Sampled : 05/05/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.67	<0.15

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832231

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505NF5994 **Lab ID : L318349-17** **Time : 815 Minutes**
Date Sampled : 05/05/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.70	<0.16

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832231

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505NE8235 **Lab ID : L318349-18** **Time : NA**
Date Sampled : 05/05/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	NA	NA
Ethylbenzene	5	<5	<5	<5	NA	NA
n-Hexane	5	<5	<5	<5	NA	NA
Toluene	5	<5	<5	<5	NA	NA
Xylene	15	<15	<15	<15	NA	NA

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832231

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505NE8184 **Lab ID : L318349-19** **Time : NA**
Date Sampled : 05/05/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	NA	NA
Ethylbenzene	5	<5	<5	<5	NA	NA
n-Hexane	5	<5	<5	<5	NA	NA
Toluene	5	<5	<5	<5	NA	NA
Xylene	15	<15	<15	<15	NA	NA

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832170

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505SKC001 **Lab ID : L318349-1** **Air Volume : 15.28 Liter**
Date Sampled : 05/05/14 **Date Analyzed : 05/16/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.1	<0.04
Ethylbenzene	5	<5	<5	<5	<0.3	<0.08
n-Hexane	5	<5	<5	<5	<0.3	<0.09
Toluene	5	<5	<5	<5	<0.3	<0.09
Xylene	15	<15	<15	<15	<0.99	<0.23

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832170

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505SKC002 **Lab ID : L318349-2** **Air Volume : 28.84 Liter**
Date Sampled : 05/05/14 **Date Analyzed : 05/16/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.53	<0.12

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832170

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505SKC003 **Lab ID : L318349-3** **Air Volume : 28.72 Liter**
Date Sampled : 05/05/14 **Date Analyzed : 05/16/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.53	<0.12

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832170

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505SKC004 **Lab ID : L318349-4** **Air Volume : 29.24 Liter**
Date Sampled : 05/05/14 **Date Analyzed : 05/16/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.52	<0.12

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832170

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505SKC005 **Lab ID : L318349-5** **Air Volume : 27.20 Liter**
Date Sampled : 05/05/14 **Date Analyzed : 05/16/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.56	<0.13

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832170

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505SKC006 **Lab ID : L318349-6** **Air Volume : 14.77 Liter**
Date Sampled : 05/05/14 **Date Analyzed : 05/16/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.1	<0.04
Ethylbenzene	5	<5	<5	<5	<0.3	<0.08
n-Hexane	5	<5	<5	<5	<0.3	<0.09
Toluene	5	<5	<5	<5	<0.3	<0.09
Xylene	15	<15	<15	<15	<1.0	<0.24

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832170

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505SKC007 **Lab ID : L318349-7** **Air Volume : 28.91 Liter**
Date Sampled : 05/05/14 **Date Analyzed : 05/16/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.52	<0.12

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832170

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505SKC008 **Lab ID : L318349-8** **Air Volume : 3.90 Liter**
Date Sampled : 05/05/14 **Date Analyzed : 05/16/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.5	<0.2
Ethylbenzene	5	<5	<5	<5	<1	<0.3
n-Hexane	5	<5	<5	<5	<1	<0.4
Toluene	5	<5	<5	<5	<1	<0.4
Xylene	15	<15	<15	<15	<3.9	<0.90

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14 - 16-MAY-14
Report ID : 832170

Account No.: 15330
Login No. : L318349

Client ID : LYVA0505SKC009 **Lab ID : L318349-9** **Air Volume : NA**
Date Sampled : 05/05/14 **Date Analyzed : 05/16/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	NA	NA
Ethylbenzene	5	<5	<5	<5	NA	NA
n-Hexane	5	<5	<5	<5	NA	NA
Toluene	5	<5	<5	<5	NA	NA
Xylene	15	<15	<15	<15	NA	NA

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

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LABORATORY FOOTNOTE REPORT

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Client Name : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received: 12-MAY-14
Date Analyzed: 15-MAY-14 - 16-MAY-14

Account No.: 15330
Login No. : L318349

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

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 preceeding 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.

L318349 (Report ID: 832170):
Benzene - Total ug corrected for a desorption efficiency of 100%.
Ethylbenzene - Total ug corrected for a desorption efficiency of 98%.
Toluene - Total ug corrected for a desorption efficiency of 97%.
Xylene - Total ug corrected for a desorption efficiency of 99%.
n-Hexane - Total ug corrected for a desorption efficiency of 102%.
SOPs: GC-SOP-12(6), GC-SOP-16(12), GC-SOP-8(11)

Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2). The estimated uncertainty applies to the media, technology, and SOP referenced in this report and does not account for the uncertainty associated with the sampling process.

Parameter	Accuracy	Mean Recovery
Benzene	+/-6.7%	94%
Ethylbenzene	+/-7.1%	98.6%
Toluene	+/-6.8%	97.9%
Xylene	+/-6.9%	96%
n-Hexane	+/-6.4%	94.8%

Parameter	Method	PEL
Benzene	mod. NIOSH 1501; GC/FID	1 ppm (TWA)
Ethylbenzene	mod. NIOSH 1501; GC/FID	100 ppm (TWA)
Toluene	mod. NIOSH 1501/OSHA 111; GC/FID	200 ppm (TWA)
Xylene	mod. NIOSH 1501; GC/FID	100 ppm (TWA)
n-Hexane	mod. NIOSH 1500; GC/FID	500 ppm (TWA)

L318349 (Report ID: 832231):
Benzene - Total ug corrected for a desorption efficiency of 100%.
Ethylbenzene - Total ug corrected for a desorption efficiency of 103%.
Toluene - Total ug corrected for a desorption efficiency of 102%.
Xylene - Total ug corrected for a desorption efficiency of 97%.
n-Hexane - Total ug corrected for a desorption efficiency of 103%.
Please note that back media results above the LOQ have been multiplied by a factor of 2.2 in all "total ug" calculations (as specified in the 3M method).
SOPs: GC-SOP-12(6), GC-SOP-16(12), GC-SOP-9(9)

L318349-17 (Report ID: 832231:
Back part of badge was received uncapped. Effect on sample results is unknown.

< -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

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LABORATORY FOOTNOTE REPORT

Client Name : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 05-MAY-14
Date Received: 12-MAY-14
Date Analyzed: 15-MAY-14 - 16-MAY-14

Account No.: 15330
Login No. : L318349

L318349 (Report ID: 832231):
Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2).
The estimated uncertainty applies to the media, technology, and SOP referenced in this report
and does not account for the uncertainty associated with the sampling process.

Parameter	Accuracy	Mean Recovery
Benzene	+/-6.4%	94.1%
Ethylbenzene	+/-7.2%	94%
Toluene	+/-6.5%	93.4%
Xylene	+/-7.7%	98.1%
n-Hexane	+/-7.9%	94.5%

Parameter	Method	PEL
Benzene	mod. NIOSH 1501; GC/FID BADGE	1 ppm (TWA)
Ethylbenzene	mod. NIOSH 1501; GC/FID BADGE	100 ppm (TWA)
Toluene	mod. NIOSH 1501/OSHA 111; GC/FID BADGE	200 ppm (TWA)
Xylene	mod. NIOSH 1501; GC/FID BADGE	100 ppm (TWA)
n-Hexane	mod. NIOSH 1500; GC/FID BADGE	500 ppm (TWA)

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

ORGANICS QC RECOVERY REPORT

Work Group WG284113

Sample: WG284113-1 **Spikelot:** IH444122-6
QC Type: DLS **Raw File:**
Analysis date 05/15/14 20:52:06 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	5.87422	6.1644	95.3	70.0 to 130.				
BENZENE	.983719	1.0365	94.9	70.0 to 130.				
TOLUENE	1.95148	2.0648	94.5	70.0 to 130.				
ETHYL BENZENE	2.00723	2.0586	97.5	70.0 to 130.				
N-HEXANE	1.79690	2.0576	87.3	70.0 to 130.				

Sample: WG284113-1 **Spikelot:** IH444122-6
QC Type: DLS **Raw File:**
Analysis date 05/15/14 20:52:06 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	6.04046	6.1644	98	70.0 to 130.				
TOLUENE	1.88765	2.0648	91.4	70.0 to 130.				
ETHYL BENZENE	1.95845	2.0586	95.1	70.0 to 130.				
N-HEXANE	1.92429	2.0576	93.5	70.0 to 130.				
BENZENE	1.01529	1.0365	97.9	70.0 to 130.				

Sample: WG284113-3 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/15/14 21:06:33 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	719.206	732.4224	98.2	90.0 to 110.				
N-HEXANE	230.638	244.4685	94.3	89.1 to 110.				
BENZENE	119.773	123.1561	97.3	89.4 to 110.				
TOLUENE	241.025	245.3289	98.2	90.0 to 110.				
ETHYL BENZENE	244.647	244.5915	100	90.0 to 110.				

Sample: WG284113-3 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/15/14 21:06:33 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	704.710	732.4224	96.2	90.0 to 110.				
N-HEXANE	232.579	244.4685	95.1	89.1 to 110.				
BENZENE	118.420	123.1561	96.2	89.4 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG284113

Sample: WG284113-3 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/15/14 21:06:33 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
TOLUENE	238.283	245.3289	97.1	90.0 to 110.				
ETHYL BENZENE	237.695	244.5915	97.2	90.0 to 110.				

Sample: WG283804-3 **Spikelot:** NA
QC Type: MBLANK **Raw File:**
Analysis date 05/15/14 21:35:30 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE(FRONT)	0	<15						
XYLENE(BACK)	0	<15						
ETHYL BENZENE(FRONT)	0	<5						
ETHYL BENZENE(BACK)	0	<5						
TOLUENE(FRONT)	0	<5						
TOLUENE(BACK)	0	<5						
BENZENE(FRONT)	0	<2						
BENZENE(BACK)	0	<2						
N-HEXANE(FRONT)	0	<5						
N-HEXANE(BACK)	0	<5						

Sample: WG283804-4 **Spikelot:** IH444122
QC Type: BS **Raw File:**
Analysis date 05/15/14 22:04:20 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1396.12	1489.75	93.7		94.7	85.6 to 110		
N-HEXANE	458.115	497.25	92.1		90.3	85.2 to 110		
BENZENE	233.494	250.5	93.2		93.2	83.9 to 110		
TOLUENE	469.125	499	94		96.9	87.6 to 110		
ETHYL BENZENE	478.281	497.5	96.1		98.1	88.0 to 110		

Sample: WG283804-4 **Spikelot:** IH444122
QC Type: BS **Raw File:**
Analysis date 05/15/14 22:04:20 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1363.84	1489.75	91.5		92.5	85.6 to 110		

ORGANICS QC RECOVERY REPORT

Work Group WG284113

Sample: WG283804-4 **Spikelot:** IH444122
QC Type: BS **Raw File:**
Analysis date 05/15/14 22:04:20 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
N-HEXANE	462.135	497.25	92.9		91.1	85.2 to 110		
BENZENE	231.165	250.5	92.3		92.3	83.9 to 110		
TOLUENE	464.088	499	93		95.9	87.6 to 110		
ETHYL BENZENE	465.084	497.5	93.5		95.4	88.0 to 110		

Sample: WG283804-5 **Spikelot:** IH444122
QC Type: BSD **Raw File:**
Analysis date 05/15/14 22:18:40 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1409.06	1489.75	94.6		95.5	85.6 to 110	-.841	-10 to 10.0
N-HEXANE	458.643	497.25	92.2		90.4	85.2 to 110	-.111	-10 to 10.0
BENZENE	234.251	250.5	93.5		93.5	83.9 to 110	-.321	-10 to 10.0
TOLUENE	472.365	499	94.7		97.6	87.6 to 110	-.72	-10 to 10.0
ETHYL BENZENE	482.613	497.5	97		99	88.0 to 110	-.913	-10 to 10.0

Sample: WG283804-5 **Spikelot:** IH444122
QC Type: BSD **Raw File:**
Analysis date 05/15/14 22:18:40 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1377.76	1489.75	92.5		93.4	85.6 to 110	-.968	-10 to 10.0
N-HEXANE	462.458	497.25	93		91.2	85.2 to 110	-.11	-10 to 10.0
BENZENE	231.767	250.5	92.5		92.5	83.9 to 110	-.216	-10 to 10.0
TOLUENE	468.230	499	93.8		96.7	87.6 to 110	-.831	-10 to 10.0
ETHYL BENZENE	469.859	497.5	94.4		96.4	88.0 to 110	-1.04	-10 to 10.0

Sample: WG284113-4 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/16/14 02:09:07 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	720.706	732.4224	98.4	90.0 to 110.				
N-HEXANE	231.470	244.4685	94.7	89.1 to 110.				
BENZENE	120.344	123.1561	97.7	89.4 to 110.				
TOLUENE	241.852	245.3289	98.6	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG284113

Sample: WG284113-4 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/16/14 02:09:07 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
ETHYL BENZENE	245.005	244.5915	100	90.0 to 110.				

Sample: WG284113-4 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/16/14 02:09:07 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	704.526	732.4224	96.2	90.0 to 110.				
N-HEXANE	233.112	244.4685	95.4	89.1 to 110.				
BENZENE	118.752	123.1561	96.4	89.4 to 110.				
TOLUENE	239.070	245.3289	97.4	90.0 to 110.				
ETHYL BENZENE	238.087	244.5915	97.3	90.0 to 110.				

Sample: WG284113-5 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/16/14 07:11:59 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	726.783	732.4224	99.2	90.0 to 110.				
N-HEXANE	230.268	244.4685	94.2	89.1 to 110.				
BENZENE	120.084	123.1561	97.5	89.4 to 110.				
TOLUENE	242.781	245.3289	99	90.0 to 110.				
ETHYL BENZENE	246.655	244.5915	101	90.0 to 110.				

Sample: WG284113-5 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/16/14 07:11:59 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	712.337	732.4224	97.3	90.0 to 110.				
N-HEXANE	231.961	244.4685	94.9	89.1 to 110.				
BENZENE	118.450	123.1561	96.2	89.4 to 110.				
TOLUENE	239.926	245.3289	97.8	90.0 to 110.				
ETHYL BENZENE	240.397	244.5915	98.3	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG284113

Sample: WG284113-6 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/16/14 07:55:08 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	724.148	732.4224	98.9	90.0 to 110.				
N-HEXANE	231.094	244.4685	94.5	89.1 to 110.				
BENZENE	119.987	123.1561	97.4	89.4 to 110.				
TOLUENE	241.523	245.3289	98.4	90.0 to 110.				
ETHYL BENZENE	245.563	244.5915	100	90.0 to 110.				

Sample: WG284113-6 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/16/14 07:55:08 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	706.435	732.4224	96.5	90.0 to 110.				
N-HEXANE	232.831	244.4685	95.2	89.1 to 110.				
BENZENE	118.339	123.1561	96.1	89.4 to 110.				
TOLUENE	238.798	245.3289	97.3	90.0 to 110.				
ETHYL BENZENE	238.527	244.5915	97.5	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283966

Sample: WG283966-1 **Spikelot:** IH443282-6
QC Type: DLS **Raw File:**
Analysis date 05/14/14 17:32:56 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	6.22195	6.1027	102	70.0 to 130.				
TOLUENE	2.05949	2.0441	101	70.0 to 130.				
ETHYL BENZENE	2.04221	2.038	100	70.0 to 130.				
N-HEXANE	1.76376	2.037	86.6	70.0 to 130.				
BENZENE	1.01929	1.0262	99.3	70.0 to 130.				

Sample: WG283966-1 **Spikelot:** IH443282-6
QC Type: DLS **Raw File:**
Analysis date 05/14/14 17:32:56 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	6.17790	6.1027	101	70.0 to 130.				
TOLUENE	2.04148	2.0441	99.9	70.0 to 130.				
ETHYL BENZENE	2.00188	2.038	98.2	70.0 to 130.				
N-HEXANE	1.73429	2.037	85.1	70.0 to 130.				
BENZENE	1.04117	1.0262	101	70.0 to 130.				

Sample: WG283966-3 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:55:29 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	721.319	733.241	98.4	90.0 to 110.				
N-HEXANE	235.543	244.7418	96.2	89.1 to 110.				
BENZENE	118.280	123.2938	95.9	89.4 to 110.				
TOLUENE	241.206	245.6031	98.2	90.0 to 110.				
ETHYL BENZENE	238.818	244.8648	97.5	90.0 to 110.				

Sample: WG283966-3 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:55:29 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	726.334	733.241	99.1	90.0 to 110.				
BENZENE	118.355	123.2938	96	89.4 to 110.				
TOLUENE	241.680	245.6031	98.4	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283966

Sample: WG283966-3 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:55:29 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
ETHYL BENZENE	238.694	244.8648	97.5	90.0 to 110.				
N-HEXANE	236.457	244.7418	96.6	89.1 to 110.				

Sample: WG283807-3 **Spikelot:** NA
QC Type: MBLANK **Raw File:**
Analysis date 05/14/14 18:40:49 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE(FRONT)	0	<15						
XYLENE(BACK)	0	<15						
BENZENE(FRONT)	0	<2						
BENZENE(BACK)	0	<2						
ETHYL BENZENE(FRONT)	0	<5						
ETHYL BENZENE(BACK)	0	<5						
N-HEXANE(FRONT)	0	<5						
N-HEXANE(BACK)	0	<5						
TOLUENE(FRONT)	0	<5						
TOLUENE(BACK)	0	<5						

Sample: WG283807-4 **Spikelot:** IH443282
QC Type: BS **Raw File:**
Analysis date 05/14/14 19:26:01 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1458.81	1489.75	97.9		101	86.5 to 110		
N-HEXANE	478.746	497.25	96.3		93.5	82.7 to 110		
BENZENE	236.575	250.5	94.4		94.4	84.5 to 110		
TOLUENE	487.228	499	97.6		95.7	83.7 to 110		
ETHYL BENZENE	489.706	497.5	98.4		95.6	83.2 to 110		

Sample: WG283807-4 **Spikelot:** IH443282
QC Type: BS **Raw File:**
Analysis date 05/14/14 19:26:01 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1463.75	1489.75	98.3		101	86.5 to 110		

ORGANICS QC RECOVERY REPORT

Work Group WG283966

Sample: WG283807-4 **Spikelot:** IH443282
QC Type: BS **Raw File:**
Analysis date 05/14/14 19:26:01 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
N-HEXANE	481.022	497.25	96.7		93.9	82.7 to 110		
BENZENE	236.503	250.5	94.4		94.4	84.5 to 110		
TOLUENE	488.190	499	97.8		95.9	83.7 to 110		
ETHYL BENZENE	489.160	497.5	98.3		95.5	83.2 to 110		

Sample: WG283807-5 **Spikelot:** IH443282
QC Type: BSD **Raw File:**
Analysis date 05/14/14 19:48:39 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1442.56	1489.75	96.8		99.8	86.5 to 110	1.2	-12.3 to 11.
N-HEXANE	473.619	497.25	95.2		92.5	82.7 to 110	1.08	-11.7 to 11.
BENZENE	233.843	250.5	93.4		93.4	84.5 to 110	1.06	-11.8 to 11.
TOLUENE	481.787	499	96.6		94.7	83.7 to 110	1.05	-11.9 to 11.
ETHYL BENZENE	484.431	497.5	97.4		94.5	83.2 to 110	1.16	-12.2 to 11.

Sample: WG283807-5 **Spikelot:** IH443282
QC Type: BSD **Raw File:**
Analysis date 05/14/14 19:48:39 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1449.32	1489.75	97.3		100	86.5 to 110	.995	-12.3 to 11.
N-HEXANE	475.680	497.25	95.7		92.9	82.7 to 110	1.07	-11.7 to 11.
BENZENE	233.919	250.5	93.4		93.4	84.5 to 110	1.06	-11.8 to 11.
TOLUENE	482.594	499	96.7		94.8	83.7 to 110	1.15	-11.9 to 11.
ETHYL BENZENE	483.793	497.5	97.2		94.4	83.2 to 110	1.16	-12.2 to 11.

Sample: WG283966-4 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/15/14 01:50:51 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	716.222	733.241	97.7	90.0 to 110.				
N-HEXANE	233.220	244.7418	95.3	89.1 to 110.				
BENZENE	117.019	123.2938	94.9	89.4 to 110.				
TOLUENE	238.872	245.6031	97.3	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283966

Sample: WG283966-4 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/15/14 01:50:51 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
ETHYL BENZENE	237.035	244.8648	96.8	90.0 to 110.				

Sample: WG283966-4 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/15/14 01:50:51 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	719.269	733.241	98.1	90.0 to 110.				
N-HEXANE	233.811	244.7418	95.5	89.1 to 110.				
BENZENE	116.890	123.2938	94.8	89.4 to 110.				
TOLUENE	239.258	245.6031	97.4	90.0 to 110.				
ETHYL BENZENE	236.839	244.8648	96.7	90.0 to 110.				

Sample: WG283966-5 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/15/14 09:45:35 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	712.659	733.241	97.2	90.0 to 110.				
N-HEXANE	235.543	244.7418	96.2	89.1 to 110.				
BENZENE	117.705	123.2938	95.5	89.4 to 110.				
TOLUENE	238.488	245.6031	97.1	90.0 to 110.				
ETHYL BENZENE	235.857	244.8648	96.3	90.0 to 110.				

Sample: WG283966-5 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/15/14 09:45:35 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	716.089	733.241	97.7	90.0 to 110.				
BENZENE	117.586	123.2938	95.4	89.4 to 110.				
TOLUENE	239.283	245.6031	97.4	90.0 to 110.				
ETHYL BENZENE	235.896	244.8648	96.3	90.0 to 110.				
N-HEXANE	236.306	244.7418	96.6	89.1 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283966

Sample: WG283966-6 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/15/14 11:38:34 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	716.192	733.241	97.7	90.0 to 110.				
N-HEXANE	233.785	244.7418	95.5	89.1 to 110.				
BENZENE	117.367	123.2938	95.2	89.4 to 110.				
TOLUENE	239.261	245.6031	97.4	90.0 to 110.				
ETHYL BENZENE	237.025	244.8648	96.8	90.0 to 110.				

Sample: WG283966-6 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/15/14 11:38:34 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	719.522	733.241	98.1	90.0 to 110.				
BENZENE	117.377	123.2938	95.2	89.4 to 110.				
TOLUENE	239.881	245.6031	97.7	90.0 to 110.				
ETHYL BENZENE	237.126	244.8648	96.8	90.0 to 110.				
N-HEXANE	234.713	244.7418	95.9	89.1 to 110.				

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Website: www.cteh.com

Center for Toxicology and Environmental Health L.L.C.
SAMPLE CHAIN OF CUSTODY AND ANALYSIS REQUEST FORM

9

	Send Report To:	Send Invoice To:
Name		Accounts Payable
Company	CTEH	CTEH
Address	5120 North Shore Drive North Little Rock, AR 72118	5120 North Shore Drive North Little Rock, AR 72118
Phone	(501)801-8500	(501)801-8500
Fax	(501)801-8501	(501)801-8501
e-mail	labresults@ct[redacted]	[redacted]accounting@cteh.com

CTEH Project #: 106190

Turnaround Requested: Same Day __Next Day (24 hour) X Norm
__Other (Specify) ______

Complete Data Packet Requested ☒Yes ☐N

Lab Contact Information:
Galson Laboratories
6601 Kirkville Road
E. Syracuse, NY 13057

Client Sample Identification	Other Sample Identification	Sample Size	Units (Check one) ✓L __cm² MIN	Sample Date	Sample Time (for non-air samples)	Initials	NIOSH 1501 BTEX + Hexane	Matrix: Air
LYVA0505SKC0001	—	15.28	✓	5/5/14	—	KP	✓ 226-01	✓
LYVA0505SKC0002	—	28.84	✓	5/5/14	—	KP	✓	✓
LYVA0505SKC0003	—	28.72	✓	5/5/14	—	KP	✓	✓
LYVA0505SKC0004	—	29.24	✓	5/5/14	—	KP	✓	✓
LYVA0505SKC0005	—	27.20	✓	5/5/14	—	KP	✓	✓
LYVA0505SKC0006	—	14.77	✓	5/5/14	—	KP	✓	✓
LYVA0505SKC0007	—	28.91	✓	5/5/14	—	KP	✓	✓
LYVA0505SKC0008	—	3.90	✓	5/5/14	—	KP	✓	✓
LYVA0505SKC0009	Blank	—	✓	5/5/14	—	KP		✓

Rec'd intact & all accounted for? (Yes) or No SK
Rec'd w/custody seals intact? Yes or No NA
Rec'd in light sensitive packaging? Yes or No NA
Rec'd with ice pack? Yes or (No) SK
Rec'd temperature compliant? (Yes) or No SK

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME	COMMENTS
		Michelle Krause [redacted]	5/12/14 1140	

51[illegible]orth Shore Drive
North Little Rock, AR 72118
Phone: (501) 801-8500
Fax: (501) 801-8501
Website: www.cteh.com

Center for Toxicology and Environmental Health L.L.C.

SAMPLE CHAIN OF CUSTODY AND ANALYSIS REQUEST FORM

(9)

	Send Report To:	Send Invoice To:
Name		Accounts Payable
Company	CTEH	CTEH
Address	5120 North Shore Drive North Little Rock, AR 72118	5120 North Shore Drive North Little Rock, AR 72118
Phone	(501)801-8500	(501)801-8500
Fax	(501)801-8501	(501)801-8501
e-mail	labresults@cteh.com [redacted]	raccounting@cteh.com

CTEH Project #: 106198

Turnaround Requested:
Same Day __Next Day (24 hour) X Norm
__Other (Specify) ____

Complete Data Packet Requested ☒Yes ☐N

Lab Contact Information:
Galson Laboratories
6601 Kirkville Road
E. Syracuse, NY 13057

Client Sample Identification	Other Sample Identification	Sample Size	Units (Check one) __L __cm² (MIN)	Sample Date	Sample Time (for non-air samples)	Initials	NIOSH 1501 BTEX + Hexane		Matrix Air
LYVA0505NF5700	NF5700	885	Min	05/5/14		KP	✓	3520	✓
LYVA10505NF5709	NF5709	840	Min	5/5/14		KP	✓		✓
LYVA0505NF5640	NF5640	827	Min	5/5/14		KP	✓		✓
LYVA0505NF5773	NF5773	820	Min	5/5/14		KP	✓		✓
LYVA0505NF6028	NF6028	900	Min	5/5/14		KP	✓		✓
LYVA0505NF5655	NF5655	904	Min	5/5/14		KP	✓		✓
LYVA0505NF6022	NF6022	850	Min	5/5/14		KP	✓		✓
LYVA0505NF5994	NF5994	815	Min	5/5/14		KP	✓		✓
LYVA0505NE8235	Blank			5/5/14		KP	✓		✓

Rec'd intact & all accounted for? (Yes) or No SK
Rec'd w/custody seals intact? Yes or No NA
Rec'd in light sensitive packaging? Yes or No NA
Rec'd with ice pack? Yes or (No) SK
Rec'd temperature compliant? (Yes) or No SK

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME	COMMENTS
				*RecvD NE8184 not on COC Blank SK
		Michelle Krause [redacted]	5/12/14 1140	

Mr. JT Wilson
Center for Toxicology & Env. Health LLC
2000 Anders Lane
Kemah, TX 77565

May 19, 2014

Lynchburg, VA

DOH ELAP #11626 Account# 15330 Login# L318324
AIHA-LAP #100324

Dear Mr. Wilson:

Enclosed are the analytical results for the samples received by our laboratory on May 12, 2014. 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. Unless otherwise requested, all samples will be discarded 14 days from the date of this report, with the exception of IOMs, which will be cleaned and disposed of after seven calendar days.

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

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

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

[redacted]

Mary G. Unangst
Laboratory Director

Enclosure(s)

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

LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832132

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506SKC001 **Lab ID : L318324-1** **Air Volume : 28.88 Liter**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.52	<0.12

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

LABORATORY ANALYSIS REPORT

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

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832132

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506SKC002 **Lab ID : L318324-2** **Air Volume : 27.09 Liter**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.56	<0.13

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

LABORATORY ANALYSIS REPORT

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

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832132

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506SKC003 **Lab ID : L318324-3** **Air Volume : 29.54 Liter**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.51	<0.12

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832132

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506SKC004 **Lab ID : L318324-4** **Air Volume : 30.09 Liter**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.50	<0.12

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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www.galsonlabs.com

LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832132

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506SKC005 **Lab ID : L318324-5** **Air Volume : 28.79 Liter**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.53	<0.12

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832132

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506SKC006 **Lab ID : L318324-6** **Air Volume : 29.18 Liter**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.52	<0.12

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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(315) 432-5227
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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832132

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506SKC007 **Lab ID : L318324-7** **Air Volume : 29.19 Liter**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.52	<0.12

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832132

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506SKC008 **Lab ID : L318324-8** **Air Volume : 36.00 Liter**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.06	<0.02
Ethylbenzene	5	<5	<5	<5	<0.1	<0.03
n-Hexane	5	<5	<5	<5	<0.1	<0.04
Toluene	5	<5	<5	<5	<0.1	<0.04
Xylene	15	<15	<15	<15	<0.42	<0.097

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

GALSON LABORATORIES

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832132

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506SKC009 **Lab ID : L318324-9** **Air Volume : NA**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	NA	NA
Ethylbenzene	5	<5	<5	<5	NA	NA
n-Hexane	5	<5	<5	<5	NA	NA
Toluene	5	<5	<5	<5	NA	NA
Xylene	15	<15	<15	<15	NA	NA

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832067

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506NE8205 **Lab ID : L318324-10** **Time : 855 Minutes**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.66	<0.15

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832067

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506NN2919 **Lab ID : L318324-11** **Time : 846 Minutes**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.67	<0.15

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

GALSON LABORATORIES

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832067

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506NE7379 **Lab ID : L318324-12** **Time : 837 Minutes**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.68	<0.16

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832067

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506NE8195 **Lab ID : L318324-13** **Time : 880 Minutes**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.06	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.64	<0.15

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832067

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506NW7424 **Lab ID : L318324-14** **Time : 870 Minutes**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.06	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.65	<0.15

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832067

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506NE7369 **Lab ID : L318324-15** **Time : 855 Minutes**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.66	<0.15

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832067

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506NE8204 **Lab ID : L318324-16** **Time : 745 Minutes**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.06
Toluene	5	<5	<5	<5	<0.2	<0.06
Xylene	15	<15	<15	<15	<0.76	<0.18

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832067

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506NE8199 **Lab ID : L318324-17** **Time : 610 Minutes**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.09	<0.03
Ethylbenzene	5	<5	<5	<5	<0.3	<0.07
n-Hexane	5	<5	<5	<5	<0.2	<0.07
Toluene	5	<5	<5	<5	<0.3	<0.07
Xylene	15	<15	<15	<15	<0.93	<0.21

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

LABORATORY ANALYSIS REPORT

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Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 15-MAY-14
Report ID : 832067

Account No.: 15330
Login No. : L318324

Client ID : LYVA0506WD8313 **Lab ID : L318324-18** **Time : NA**
Date Sampled : 05/06/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	NA	NA
Ethylbenzene	5	<5	<5	<5	NA	NA
n-Hexane	5	<5	<5	<5	NA	NA
Toluene	5	<5	<5	<5	NA	NA
Xylene	15	<15	<15	<15	NA	NA

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

GALSON LABORATORIES

LABORATORY FOOTNOTE REPORT

Client Name : CSX Transportation
Site : Lynchburg, VA

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FAX: (315) 437-0571
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Date Sampled : 06-MAY-14
Date Received: 12-MAY-14
Date Analyzed: 15-MAY-14

Account No.: 15330
Login No. : L318324

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

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 preceeding 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.

L318324 (Report ID: 832132):
Benzene - Total ug corrected for a desorption efficiency of 100%.
Ethylbenzene - Total ug corrected for a desorption efficiency of 98%.
Toluene - Total ug corrected for a desorption efficiency of 97%.
Xylene - Total ug corrected for a desorption efficiency of 99%.
n-Hexane - Total ug corrected for a desorption efficiency of 102%.
SOPs: GC-SOP-12(6), GC-SOP-16(12), GC-SOP-8(11)

Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2). The estimated uncertainty applies to the media, technology, and SOP referenced in this report and does not account for the uncertainty associated with the sampling process.

Parameter	Accuracy	Mean Recovery
Benzene	+/-6.7%	94%
Ethylbenzene	+/-7.1%	98.6%
Toluene	+/-6.8%	97.9%
Xylene	+/-6.9%	96%
n-Hexane	+/-6.4%	94.8%

Parameter	Method	PEL
Benzene	mod. NIOSH 1501; GC/FID	1 ppm (TWA)
Ethylbenzene	mod. NIOSH 1501; GC/FID	100 ppm (TWA)
Toluene	mod. NIOSH 1501/OSHA 111; GC/FID	200 ppm (TWA)
Xylene	mod. NIOSH 1501; GC/FID	100 ppm (TWA)
n-Hexane	mod. NIOSH 1500; GC/FID	500 ppm (TWA)

L318324 (Report ID: 832067):
Benzene - Total ug corrected for a desorption efficiency of 100%.
Ethylbenzene - Total ug corrected for a desorption efficiency of 103%.
Toluene - Total ug corrected for a desorption efficiency of 102%.
Xylene - Total ug corrected for a desorption efficiency of 97%.
n-Hexane - Total ug corrected for a desorption efficiency of 103%.
Please note that back media results above the LOQ have been multiplied by a factor of 2.2 in all "total ug" calculations (as specified in the 3M method).
SOPs: GC-SOP-12(6), GC-SOP-16(12), GC-SOP-9(9)

< -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

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LABORATORY FOOTNOTE REPORT

Client Name : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 06-MAY-14
Date Received: 12-MAY-14
Date Analyzed: 15-MAY-14

Account No.: 15330
Login No. : L318324

Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2). The estimated uncertainty applies to the media, technology, and SOP referenced in this report and does not account for the uncertainty associated with the sampling process.

Parameter	Accuracy	Mean Recovery
Benzene	+/-6.4%	94.1%
Ethylbenzene	+/-7.2%	94%
Toluene	+/-6.5%	93.4%
Xylene	+/-7.7%	98.1%
n-Hexane	+/-7.9%	94.5%

Parameter	Method	PEL
Benzene	mod. NIOSH 1501; GC/FID BADGE	1 ppm (TWA)
Ethylbenzene	mod. NIOSH 1501; GC/FID BADGE	100 ppm (TWA)
Toluene	mod. NIOSH 1501/OSHA 111; GC/FID BADGE	200 ppm (TWA)
Xylene	mod. NIOSH 1501; GC/FID BADGE	100 ppm (TWA)
n-Hexane	mod. NIOSH 1500; GC/FID BADGE	500 ppm (TWA)

< -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	

ORGANICS QC RECOVERY REPORT

Work Group WG283968

Sample: WG283968-1 **Spikelot:** IH442682-3
QC Type: DLS **Raw File:**
Analysis date 05/14/14 17:24:41 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	6.24732	6.1568	101	70.0 to 130.				
BENZENE	.982522	1.0353	94.9	70.0 to 130.				
TOLUENE	2.07759	2.0623	101	70.0 to 130.				
ETHYL BENZENE	2.07481	2.0561	101	70.0 to 130.				
N-HEXANE	1.61005	2.055	78.3	70.0 to 130.				

Sample: WG283968-1 **Spikelot:** IH442682-3
QC Type: DLS **Raw File:**
Analysis date 05/14/14 17:24:41 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	6.15255	6.1568	99.9	70.0 to 130.				
TOLUENE	2.45624	2.0623	119	70.0 to 130.				
ETHYL BENZENE	1.94675	2.0561	94.7	70.0 to 130.				
N-HEXANE	1.92153	2.055	93.5	70.0 to 130.				
BENZENE	.976936	1.0353	94.4	70.0 to 130.				

Sample: WG283968-3 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:39:23 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	706.914	732.4224	96.5	90.0 to 110.				
N-HEXANE	227.897	244.4685	93.2	89.1 to 110.				
BENZENE	116.855	123.1561	94.9	89.4 to 110.				
TOLUENE	238.715	245.3289	97.3	90.0 to 110.				
ETHYL BENZENE	238.160	244.5915	97.4	90.0 to 110.				

Sample: WG283968-3 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:39:23 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	708.745	732.4224	96.8	90.0 to 110.				
N-HEXANE	230.516	244.4685	94.3	89.1 to 110.				
BENZENE	117.269	123.1561	95.2	89.4 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283968

Sample: WG283968-3 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:39:23 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
TOLUENE	235.517	245.3289	96	90.0 to 110.				
ETHYL BENZENE	242.038	244.5915	99	90.0 to 110.				

Sample: WG283710-3 **Spikelot:** NA
QC Type: MBLANK **Raw File:**
Analysis date 05/14/14 18:09:01 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE(FRONT)	0	<15						
XYLENE(BACK)	0	<15						
ETHYL BENZENE(FRONT)	0	<5						
ETHYL BENZENE(BACK)	0	<5						
TOLUENE(FRONT)	0	<5						
TOLUENE(BACK)	0	<5						
BENZENE(FRONT)	0	<2						
BENZENE(BACK)	0	<2						
N-HEXANE(FRONT)	0	<5						
N-HEXANE(BACK)	0	<5						

Sample: WG283710-4 **Spikelot:** IH442862
QC Type: BS **Raw File:**
Analysis date 05/14/14 18:38:29 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1406.58	1489.75	94.4		95.4	85.6 to 110		
N-HEXANE	464.138	497.25	93.3		91.5	85.2 to 110		
BENZENE	234.192	250.5	93.5		93.5	83.9 to 110		
TOLUENE	478.786	499	95.9		98.9	87.6 to 110		
ETHYL BENZENE	479.668	497.5	96.4		98.4	88.0 to 110		

Sample: WG283710-4 **Spikelot:** IH442862
QC Type: BS **Raw File:**
Analysis date 05/14/14 18:38:29 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1410.30	1489.75	94.7		95.6	85.6 to 110		

ORGANICS QC RECOVERY REPORT

Work Group WG283968

Sample: WG283710-4 **Spikelot:** IH442862
QC Type: BS **Raw File:**
Analysis date 05/14/14 18:38:29 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
N-HEXANE	467.228	497.25	94		92.1	85.2 to 110		
BENZENE	234.981	250.5	93.8		93.8	83.9 to 110		
TOLUENE	472.117	499	94.6		97.5	87.6 to 110		
ETHYL BENZENE	487.072	497.5	97.9		99.9	88.0 to 110		

Sample: WG283710-5 **Spikelot:** IH442862
QC Type: BSD **Raw File:**
Analysis date 05/14/14 18:53:18 **Approval Status:** NEED
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1420.69	1489.75	95.4		96.3	85.6 to 110	-.939	-10 to 10.0
N-HEXANE	468.387	497.25	94.2		92.3	85.2 to 110	-.871	-10 to 10.0
BENZENE	236.021	250.5	94.2		94.2	83.9 to 110	-.746	-10 to 10.0
TOLUENE	483.730	499	96.9		99.9	87.6 to 110	-1.01	-10 to 10.0
ETHYL BENZENE	484.910	497.5	97.5		99.5	88.0 to 110	-1.11	-10 to 10.0

Sample: WG283710-5 **Spikelot:** IH442862
QC Type: BSD **Raw File:**
Analysis date 05/14/14 18:53:18 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1425.98	1489.75	95.7		96.7	85.6 to 110	-1.14	-10 to 10.0
BENZENE	237.883	250.5	95		95	83.9 to 110	-1.27	-10 to 10.0
TOLUENE	477.139	499	95.6		98.6	87.6 to 110	-1.12	-10 to 10.0
ETHYL BENZENE	492.626	497.5	99		101	88.0 to 110	-1.1	-10 to 10.0
N-HEXANE	471.683	497.25	94.9		93	85.2 to 110	-.972	-10 to 10.0

Sample: WG283968-4 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 22:50:04 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	697.832	732.4224	95.3	90.0 to 110.				
N-HEXANE	226.109	244.4685	92.5	89.1 to 110.				
BENZENE	115.947	123.1561	94.1	89.4 to 110.				
TOLUENE	235.748	245.3289	96.1	90.0 to 110.				

Sample: WG283968-4 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 22:50:04 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
ETHYL BENZENE	235.043	244.5915	96.1	90.0 to 110.				

Sample: WG283968-4 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 22:50:04 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	699.050	732.4224	95.4	90.0 to 110.				
BENZENE	116.662	123.1561	94.7	89.4 to 110.				
TOLUENE	232.808	245.3289	94.9	90.0 to 110.				
ETHYL BENZENE	238.192	244.5915	97.4	90.0 to 110.				
N-HEXANE	228.617	244.4685	93.5	89.1 to 110.				

Sample: WG283968-5 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 04:00:39 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	704.980	732.4224	96.3	90.0 to 110.				
N-HEXANE	227.114	244.4685	92.9	89.1 to 110.				
BENZENE	116.760	123.1561	94.8	89.4 to 110.				
TOLUENE	237.495	245.3289	96.8	90.0 to 110.				
ETHYL BENZENE	237.217	244.5915	97	90.0 to 110.				

Sample: WG283968-5 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 04:00:39 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	706.749	732.4224	96.5	90.0 to 110.				
BENZENE	117.032	123.1561	95	89.4 to 110.				
TOLUENE	234.621	245.3289	95.6	90.0 to 110.				
ETHYL BENZENE	241.057	244.5915	98.6	90.0 to 110.				
N-HEXANE	229.643	244.4685	93.9	89.1 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283968

Sample: WG283968-6 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 04:44:56 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	705.497	732.4224	96.3	90.0 to 110.				
N-HEXANE	226.996	244.4685	92.9	89.1 to 110.				
BENZENE	116.594	123.1561	94.7	89.4 to 110.				
TOLUENE	237.728	245.3289	96.9	90.0 to 110.				
ETHYL BENZENE	237.544	244.5915	97.1	90.0 to 110.				

Sample: WG283968-6 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 04:44:56 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	707.027	732.4224	96.5	90.0 to 110.				
N-HEXANE	229.811	244.4685	94	89.1 to 110.				
BENZENE	117.483	123.1561	95.4	89.4 to 110.				
TOLUENE	235.461	245.3289	96	90.0 to 110.				
ETHYL BENZENE	241.185	244.5915	98.6	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283973

Sample: WG283973-1 **Spikelot:** IH442682-3
QC Type: DLS **Raw File:**
Analysis date 05/14/14 17:04:26 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	6.73247	6.1568	109	70.0 to 130.				
TOLUENE	2.14394	2.0623	104	70.0 to 130.				
ETHYL BENZENE	2.23788	2.0561	109	70.0 to 130.				
N-HEXANE	1.78063	2.055	86.6	70.0 to 130.				
BENZENE	1.01060	1.0353	97.6	70.0 to 130.				

Sample: WG283973-1 **Spikelot:** IH442682-3
QC Type: DLS **Raw File:**
Analysis date 05/14/14 17:04:26 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	6.88043	6.1568	112	70.0 to 130.				
TOLUENE	2.17287	2.0623	105	70.0 to 130.				
ETHYL BENZENE	2.25161	2.0561	110	70.0 to 130.				
N-HEXANE	1.75263	2.055	85.3	70.0 to 130.				
BENZENE	1.01158	1.0353	97.7	70.0 to 130.				

Sample: WG283973-3 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:27:30 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	765.232	732.4224	104	90.0 to 110.				
N-HEXANE	227.926	244.4685	93.2	89.1 to 110.				
BENZENE	116.460	123.1561	94.6	89.4 to 110.				
TOLUENE	248.124	245.3289	101	90.0 to 110.				
ETHYL BENZENE	254.590	244.5915	104	90.0 to 110.				

Sample: WG283973-3 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:27:30 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	775.854	732.4224	106	90.0 to 110.				
N-HEXANE	227.028	244.4685	92.9	89.1 to 110.				
BENZENE	116.641	123.1561	94.7	89.4 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283973

Sample: WG283973-3 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:27:30 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
TOLUENE	251.604	245.3289	103	90.0 to 110.				
ETHYL BENZENE	258.293	244.5915	106	90.0 to 110.				

Sample: WG283695-3 **Spikelot:** NA
QC Type: MBLANK **Raw File:**
Analysis date 05/14/14 18:14:10 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE(FRONT)	0	<15						
XYLENE(BACK)	0	<15						
BENZENE(FRONT)	0	<2						
BENZENE(BACK)	0	<2						
ETHYL BENZENE(FRONT)	0	<5						
ETHYL BENZENE(BACK)	0	<5						
N-HEXANE(FRONT)	0	<5						
N-HEXANE(BACK)	0	<5						
TOLUENE(FRONT)	0	<5						
TOLUENE(BACK)	0	<5						

Sample: WG283695-4 **Spikelot:** IH442862
QC Type: BS **Raw File:**
Analysis date 05/14/14 19:00:41 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1521.55	1489.75	102		105	86.5 to 110		
N-HEXANE	469.285	497.25	94.4		91.6	82.7 to 110		
BENZENE	233.706	250.5	93.3		93.3	84.5 to 110		
TOLUENE	497.513	499	99.7		97.7	83.7 to 110		
ETHYL BENZENE	514.473	497.5	103		100	83.2 to 110		

Sample: WG283695-4 **Spikelot:** IH442862
QC Type: BS **Raw File:**
Analysis date 05/14/14 19:00:41 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1543.40	1489.75	104		107	86.5 to 110		

ORGANICS QC RECOVERY REPORT

Work Group WG283973

Sample: WG283695-4 **Spikelot:** IH442862
QC Type: BS **Raw File:**
Analysis date 05/14/14 19:00:41 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
N-HEXANE	465.325	497.25	93.6		90.9	82.7 to 110		
BENZENE	234.421	250.5	93.6		93.6	84.5 to 110		
TOLUENE	504.691	499	101		99.2	83.7 to 110		
ETHYL BENZENE	522.314	497.5	105		102	83.2 to 110		

Sample: WG283695-5 **Spikelot:** IH442862
QC Type: BSD **Raw File:**
Analysis date 05/14/14 19:24:06 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1514.81	1489.75	102		105	86.5 to 110	0	-12.3 to 11.9
N-HEXANE	468.978	497.25	94.3		91.6	82.7 to 110	0	-11.7 to 11.6
BENZENE	232.823	250.5	92.9		92.9	84.5 to 110	.43	-11.8 to 11.2
TOLUENE	495.272	499	99.3		97.3	83.7 to 110	.41	-11.9 to 11.7
ETHYL BENZENE	512.438	497.5	103		100	83.2 to 110	0	-12.2 to 11.8

Sample: WG283695-5 **Spikelot:** IH442862
QC Type: BSD **Raw File:**
Analysis date 05/14/14 19:24:06 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1535.02	1489.75	103		106	86.5 to 110	.939	-12.3 to 11.9
N-HEXANE	464.586	497.25	93.4		90.7	82.7 to 110	.22	-11.7 to 11.6
BENZENE	233.490	250.5	93.2		93.2	84.5 to 110	.428	-11.8 to 11.2
TOLUENE	502.275	499	101		98.7	83.7 to 110	.505	-11.9 to 11.7
ETHYL BENZENE	519.772	497.5	104		101	83.2 to 110	.985	-12.2 to 11.8

Sample: WG283973-4 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 01:36:31 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	752.402	732.4224	103	90.0 to 110.				
N-HEXANE	228.861	244.4685	93.6	89.1 to 110.				
BENZENE	116.461	123.1561	94.6	89.4 to 110.				
TOLUENE	246.566	245.3289	101	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283973

Sample: WG283973-4 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 01:36:31 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
ETHYL BENZENE	250.569	244.5915	102	90.0 to 110.				

Sample: WG283973-4 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 01:36:31 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	766.772	732.4224	105	90.0 to 110.				
N-HEXANE	227.894	244.4685	93.2	89.1 to 110.				
BENZENE	116.702	123.1561	94.8	89.4 to 110.				
TOLUENE	250.148	245.3289	102	90.0 to 110.				
ETHYL BENZENE	255.509	244.5915	104	90.0 to 110.				

Sample: WG283973-5 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 09:44:53 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	758.535	732.4224	104	90.0 to 110.				
N-HEXANE	229.964	244.4685	94.1	89.1 to 110.				
BENZENE	117.108	123.1561	95.1	89.4 to 110.				
TOLUENE	248.132	245.3289	101	90.0 to 110.				
ETHYL BENZENE	252.580	244.5915	103	90.0 to 110.				

Sample: WG283973-5 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 09:44:53 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	773.088	732.4224	106	90.0 to 110.				
N-HEXANE	228.720	244.4685	93.6	89.1 to 110.				
BENZENE	117.206	123.1561	95.2	89.4 to 110.				
TOLUENE	251.471	245.3289	103	90.0 to 110.				
ETHYL BENZENE	257.273	244.5915	105	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283973

Sample: WG283973-6 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 10:54:33 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	759.887	732.4224	104	90.0 to 110.				
N-HEXANE	230.288	244.4685	94.2	89.1 to 110.				
BENZENE	117.286	123.1561	95.2	89.4 to 110.				
TOLUENE	248.621	245.3289	101	90.0 to 110.				
ETHYL BENZENE	253.065	244.5915	103	90.0 to 110.				

Sample: WG283973-6 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 10:54:33 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	774.545	732.4224	106	90.0 to 110.				
BENZENE	117.369	123.1561	95.3	89.4 to 110.				
TOLUENE	251.956	245.3289	103	90.0 to 110.				
ETHYL BENZENE	257.929	244.5915	105	90.0 to 110.				
N-HEXANE	229.067	244.4685	93.7	89.1 to 110.				

5120 North Shore Drive
North Little Rock, AR 72118
Phone: (501) 801-8500
Fax: (501) 801-8501
Website: www.cteh.com

Center for Toxicology and Environmental Health L.L.C.
SAMPLE CHAIN OF CUSTODY AND ANALYSIS REQUEST FORM

11

	Send Report To:	Send Invoice To:
Name		Accounts Payable
Company	CTEH	CTEH
Address	5120 North Shore Drive North Little Rock, AR 72118	5120 North Shore Drive North Little Rock, AR 72118
Phone	(501)801-8500	(501)801-8500
Fax	(501)801-8501	(501)801-8501
e-mail	labresults@cteh.com [redacted]	lraccounting@cteh.com

CTEH Project #: 186190

Turnaround Requested:
Same Day __Next Day (24 hour) X Norm
__Other (Specify) _____

Complete Data Packet Requested ☒Yes ☐N

Lab Contact Information:
Galson Laboratories
6601 Kirkville Road
E. Syracuse, NY 13057

Client Sample Identification	Other Sample Identification	Sample Size	Units (Check one) ✓L __cm² MIN	Sample Date	Sample Time (for non-air samples)	Initials	NIOSH 1501 BTEX +Hexane								Media Air
LYVA05586-SKC0001		28.82	✓	5/6/14		KP	✓						22:01		✓
LYVA05586 SKC0002		27.69	✓	5/6/14		KP	✓								✓
LYVA05586 SKC0003		29.54	✓	5/6/14		KP	✓								✓
LYVA05586 SKC0004		30.09	✓	5/6/14		KP	✓								✓
LYVA05586 SKC0005		28.79	✓	5/6/14		KP	✓								✓
LYVA05586 SKC0006		29.18	✓	5/6/14		KP	✓								✓
LYVA05586 SKC0007		29.19	✓	5/6/14		KP	✓								✓
LYVA05586 SKC0008		36.06	✓	5/6/14		KP	✓								✓
LYVA05586 SKC0009	Blank		✓	5/6/14		KP	✓								✓

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
		Michelle Krause [redacted]	5/12/14 1140

Rec'd intact & all accounted for? Yes or No SL
Rec'd w/custody seals intact? Yes or No NA
Rec'd in light sensitive packaging? Yes or No NA
Rec'd with ice pack? Yes or No SL
Rec'd temperature compliant? Yes or No SL

5120 North Shore Drive
North Little Rock, AR 72118
Phone: (501) 801-8500
Fax: (501) 801-8501
Website: www.cteh.com

Center for Toxicology and Environmental Health L.L.C.
SAMPLE CHAIN OF CUSTODY AND ANALYSIS REQUEST FORM

	Send Report To:	Send Invoice To:
Name		Accounts Payable
Company	CTEH	CTEH
Address	5120 North Shore Drive North Little Rock, AR 72118	5120 North Shore Drive North Little Rock, AR 72118
Phone	(501)801-8500	(501)801-8500
Fax	(501)801-8501	(501)801-8501
e-mail	labresults@cteh.com [redacted]	raccounting@cteh.com

CTEH Project #: 186198 (11)

Turnaround Requested:
Same Day __Next Day (24 hour) _X Norm
__Other (Specify) _____

Complete Data Packet Requested ☒Yes ☐N

Lab Contact Information:
Galson Laboratories
6601 Kirkville Road
E. Syracuse, NY 13057

Client Sample Identification	Other Sample Identification	Sample Size	Units (Check one) __L __cm² MIN	Sample Date	Sample Time (for non-air samples)	Initials	NIOSH 1501 BTEX + Hexane	Media Air
LYVA05086 NE8205	NE8205	855	✓	5/6/14		VP	✓	✓
LYVA05086 NN2919	NN2919	846	✓	5/6/14		VP	✓	✓
LYVA05086 NE7379	NE7379	837	✓	5/6/14		VP	✓	✓
LYVA05086 NE8195	NE8195	886	✓	5/6/14		VP	✓	✓
LYVA05086 NW7424	NW7424	878	✓	5/6/14		VP	✓	✓
LYVA05086 NE7369	NE7369	855	✓	5/6/14		VP	✓	✓
LYVA05086 NE8204	NE8204	745	✓	5/6/14		VP	✓	✓
LYVA05086 NE8199	NE8199	616	✓	5/6/14		VP	✓	✓
LYVA05086 WD8313	Blank		✓	5/6/14		VP	✓	✓

Rec'd intact & all accounted for? Yes or No SL
Rec'd w/custody seals intact? Yes or No NA
Rec'd in light sensitive packaging? Yes or No NA
Rec'd with ice pack? Yes or No SL
Rec'd temperature compliant? Yes or No SL

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME	COMMENTS
		Michelle Krause [redacted]	5/12/14 1140	

Mr. JT Wilson
Center for Toxicology & Env. Health LLC
2000 Anders Lane
Kemah, TX 77565

May 19, 2014

Lynchburg, VA

DOH ELAP #11626 Account# 15330 Login# L318322
AIHA-LAP #100324

Dear Mr. Wilson:

Enclosed are the analytical results for the samples received by our laboratory on May 12, 2014. 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. Unless otherwise requested, all samples will be discarded 14 days from the date of this report, with the exception of IOMs, which will be cleaned and disposed of after seven calendar days.

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

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

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

[redacted]

Mary G. Unangst
Laboratory Director

Enclosure(s)

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

LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832131

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507SKC001 **Lab ID : L318322-1** **Air Volume : 29.37 Liter**
Date Sampled : 05/07/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.52	<0.12

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

GALSON LABORATORIES

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East Syracuse, NY 13057
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FAX: (315) 437-0571
www.galsonlabs.com

LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832131

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507SKC002 **Lab ID : L318322-2** **Air Volume : 27.56 Liter**
Date Sampled : 05/07/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.55	<0.13

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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FAX: (315) 437-0571
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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832131

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507SKC003 **Lab ID : L318322-3** **Air Volume : 24.02 Liter**
Date Sampled : 05/07/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.03
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.06
Toluene	5	<5	<5	<5	<0.2	<0.06
Xylene	15	<15	<15	<15	<0.63	<0.15

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

GALSON LABORATORIES

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East Syracuse, NY 13057
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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832131

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507SKC004 **Lab ID : L318322-4** **Air Volume : 28.97 Liter**
Date Sampled : 05/07/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.52	<0.12

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

LABORATORY ANALYSIS REPORT

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

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832131

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507SKC005 **Lab ID : L318322-5** **Air Volume : 8.59 Liter**
Date Sampled : 05/07/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.2	<0.07
Ethylbenzene	5	<5	<5	<5	<0.6	<0.1
n-Hexane	5	<5	<5	<5	<0.6	<0.2
Toluene	5	<5	<5	<5	<0.6	<0.2
Xylene	15	<15	<15	<15	<1.8	<0.41

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

LABORATORY ANALYSIS REPORT

6601 Kirkville Road
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Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832131

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507SKC006 **Lab ID : L318322-6** **Air Volume : 29.04 Liter**
Date Sampled : 05/07/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.52	<0.12

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832131

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507SKC007 **Lab ID : L318322-7** **Air Volume : 26.55 Liter**
Date Sampled : 05/07/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.57	<0.13

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832131

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507SKC008 **Lab ID : L318322-8** **Air Volume : 4.22 Liter**
Date Sampled : 05/07/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.5	<0.1
Ethylbenzene	5	<5	<5	<5	<1	<0.3
n-Hexane	5	<5	<5	<5	<1	<0.3
Toluene	5	<5	<5	<5	<1	<0.3
Xylene	15	<15	<15	<15	<3.6	<0.83

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832131

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507SKC009 **Lab ID : L318322-9** **Air Volume : NA**
Date Sampled : 05/07/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	NA	NA
Ethylbenzene	5	<5	<5	<5	NA	NA
n-Hexane	5	<5	<5	<5	NA	NA
Toluene	5	<5	<5	<5	NA	NA
Xylene	15	<15	<15	<15	NA	NA

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

Collection Media : 226-01

Submitted by: mln
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832066

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507WD8943 **Lab ID : L318322-10** **Time : 729 Minutes**
Date Sampled : 05/07/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.06
n-Hexane	5	<5	<5	<5	<0.2	<0.06
Toluene	5	<5	<5	<5	<0.2	<0.06
Xylene	15	<15	<15	<15	<0.78	<0.18

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832066

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507WD8790 **Lab ID : L318322-11** **Time : 731 Minutes**
Date Sampled : 05/07/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.06
n-Hexane	5	<5	<5	<5	<0.2	<0.06
Toluene	5	<5	<5	<5	<0.2	<0.06
Xylene	15	<15	<15	<15	<0.77	<0.18

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832066

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507WD8988 **Lab ID : L318322-12** **Time : 738 Minutes**
Date Sampled : 05/07/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.06
n-Hexane	5	<5	<5	<5	<0.2	<0.06
Toluene	5	<5	<5	<5	<0.2	<0.06
Xylene	15	<15	<15	<15	<0.77	<0.18

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832066

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507WD8761 **Lab ID : L318322-13** **Time : 739 Minutes**
Date Sampled : 05/07/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.06
n-Hexane	5	<5	<5	<5	<0.2	<0.06
Toluene	5	<5	<5	<5	<0.2	<0.06
Xylene	15	<15	<15	<15	<0.77	<0.18

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

LABORATORY ANALYSIS REPORT

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Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832066

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507WD8939 **Lab ID : L318322-14** **Time : 730 Minutes**
Date Sampled : 05/07/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.06
n-Hexane	5	<5	<5	<5	<0.2	<0.06
Toluene	5	<5	<5	<5	<0.2	<0.06
Xylene	15	<15	<15	<15	<0.78	<0.18

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832066

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507WD8924 **Lab ID : L318322-15** **Time : 735 Minutes**
Date Sampled : 05/07/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.06
n-Hexane	5	<5	<5	<5	<0.2	<0.06
Toluene	5	<5	<5	<5	<0.2	<0.06
Xylene	15	<15	<15	<15	<0.77	<0.18

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832066

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507WD8842 **Lab ID : L318322-16** **Time : 750 Minutes**
Date Sampled : 05/07/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.06
Toluene	5	<5	<5	<5	<0.2	<0.06
Xylene	15	<15	<15	<15	<0.76	<0.17

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832066

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507WD8942 **Lab ID : L318322-17** **Time : 741 Minutes**
Date Sampled : 05/07/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.06
n-Hexane	5	<5	<5	<5	<0.2	<0.06
Toluene	5	<5	<5	<5	<0.2	<0.06
Xylene	15	<15	<15	<15	<0.76	<0.18

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 15-MAY-14
Report ID : 832066

Account No.: 15330
Login No. : L318322

Client ID : LYVA0507WD8253 **Lab ID : L318322-18** **Time : NA**
Date Sampled : 05/07/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	NA	NA
Ethylbenzene	5	<5	<5	<5	NA	NA
n-Hexane	5	<5	<5	<5	NA	NA
Toluene	5	<5	<5	<5	NA	NA
Xylene	15	<15	<15	<15	NA	NA

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

Collection Media : M3M-3520

Submitted by: mln
Approved by : tlh
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY FOOTNOTE REPORT

Client Name : CSX Transportation
Site : Lynchburg, VA

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Date Sampled : 07-MAY-14
Date Received: 12-MAY-14
Date Analyzed: 14-MAY-14 - 15-MAY-14

Account No.: 15330
Login No. : L318322

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

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 preceeding 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.

L318322 (Report ID: 832131):
Benzene - Total ug corrected for a desorption efficiency of 100%.
Ethylbenzene - Total ug corrected for a desorption efficiency of 98%.
Toluene - Total ug corrected for a desorption efficiency of 97%.
Xylene - Total ug corrected for a desorption efficiency of 99%.
n-Hexane - Total ug corrected for a desorption efficiency of 102%.
SOPs: GC-SOP-12(6), GC-SOP-16(12), GC-SOP-8(11)

Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2). The estimated uncertainty applies to the media, technology, and SOP referenced in this report and does not account for the uncertainty associated with the sampling process.

Parameter	Accuracy	Mean Recovery
Benzene	+/-6.7%	94%
Ethylbenzene	+/-7.1%	98.6%
Toluene	+/-6.8%	97.9%
Xylene	+/-6.9%	96%
n-Hexane	+/-6.4%	94.8%

Parameter	Method	PEL
Benzene	mod. NIOSH 1501; GC/FID	1 ppm (TWA)
Ethylbenzene	mod. NIOSH 1501; GC/FID	100 ppm (TWA)
Toluene	mod. NIOSH 1501/OSHA 111; GC/FID	200 ppm (TWA)
Xylene	mod. NIOSH 1501; GC/FID	100 ppm (TWA)
n-Hexane	mod. NIOSH 1500; GC/FID	500 ppm (TWA)

L318322 (Report ID: 832066):
Benzene - Total ug corrected for a desorption efficiency of 100%.
Ethylbenzene - Total ug corrected for a desorption efficiency of 103%.
Toluene - Total ug corrected for a desorption efficiency of 102%.
Xylene - Total ug corrected for a desorption efficiency of 97%.
n-Hexane - Total ug corrected for a desorption efficiency of 103%.
Please note that back media results above the LOQ have been multiplied by a factor of 2.2 in all "total ug" calculations (as specified in the 3M method).
SOPs: GC-SOP-12(6), GC-SOP-16(12), GC-SOP-8(11)

L318322-10 (Report ID: 832066:
Back part of Badge was received uncapped. Effect on sample results is unknown.

< -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

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LABORATORY FOOTNOTE REPORT

Client Name : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 07-MAY-14
Date Received: 12-MAY-14
Date Analyzed: 14-MAY-14 - 15-MAY-14

Account No.: 15330
Login No. : L318322

L318322 (Report ID: 832066):
Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2).
The estimated uncertainty applies to the media, technology, and SOP referenced in this report
and does not account for the uncertainty associated with the sampling process.

Parameter	Accuracy	Mean Recovery
Benzene	+/-6.4%	94.1%
Ethylbenzene	+/-7.2%	94%
Toluene	+/-6.5%	93.4%
Xylene	+/-7.7%	98.1%
n-Hexane	+/-7.9%	94.5%

Parameter	Method	PEL
Benzene	mod. NIOSH 1501; GC/FID	1 ppm (TWA)
Ethylbenzene	mod. NIOSH 1501; GC/FID	100 ppm (TWA)
Toluene	mod. NIOSH 1501/OSHA 111; GC/FID	200 ppm (TWA)
Xylene	mod. NIOSH 1501; GC/FID	100 ppm (TWA)
n-Hexane	mod. NIOSH 1500; GC/FID	500 ppm (TWA)

< -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	

ORGANICS QC RECOVERY REPORT

Work Group WG283968

Sample: WG283968-1 **Spikelot:** IH442682-3
QC Type: DLS **Raw File:**
Analysis date 05/14/14 17:24:41 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	6.24732	6.1568	101	70.0 to 130.				
BENZENE	.982522	1.0353	94.9	70.0 to 130.				
TOLUENE	2.07759	2.0623	101	70.0 to 130.				
ETHYL BENZENE	2.07481	2.0561	101	70.0 to 130.				
N-HEXANE	1.61005	2.055	78.3	70.0 to 130.				

Sample: WG283968-1 **Spikelot:** IH442682-3
QC Type: DLS **Raw File:**
Analysis date 05/14/14 17:24:41 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	6.15255	6.1568	99.9	70.0 to 130.				
TOLUENE	2.45624	2.0623	119	70.0 to 130.				
ETHYL BENZENE	1.94675	2.0561	94.7	70.0 to 130.				
N-HEXANE	1.92153	2.055	93.5	70.0 to 130.				
BENZENE	.976936	1.0353	94.4	70.0 to 130.				

Sample: WG283968-3 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:39:23 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	706.914	732.4224	96.5	90.0 to 110.				
N-HEXANE	227.897	244.4685	93.2	89.1 to 110.				
BENZENE	116.855	123.1561	94.9	89.4 to 110.				
TOLUENE	238.715	245.3289	97.3	90.0 to 110.				
ETHYL BENZENE	238.160	244.5915	97.4	90.0 to 110.				

Sample: WG283968-3 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:39:23 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	708.745	732.4224	96.8	90.0 to 110.				
N-HEXANE	230.516	244.4685	94.3	89.1 to 110.				
BENZENE	117.269	123.1561	95.2	89.4 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283968

Sample: WG283968-3 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:39:23 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
TOLUENE	235.517	245.3289	96	90.0 to 110.				
ETHYL BENZENE	242.038	244.5915	99	90.0 to 110.				

Sample: WG283710-3 **Spikelot:** NA
QC Type: MBLANK **Raw File:**
Analysis date 05/14/14 18:09:01 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE(FRONT)	0	<15						
XYLENE(BACK)	0	<15						
ETHYL BENZENE(FRONT)	0	<5						
ETHYL BENZENE(BACK)	0	<5						
TOLUENE(FRONT)	0	<5						
TOLUENE(BACK)	0	<5						
BENZENE(FRONT)	0	<2						
BENZENE(BACK)	0	<2						
N-HEXANE(FRONT)	0	<5						
N-HEXANE(BACK)	0	<5						

Sample: WG283710-4 **Spikelot:** IH442862
QC Type: BS **Raw File:**
Analysis date 05/14/14 18:38:29 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1406.58	1489.75	94.4		95.4	85.6 to 110		
N-HEXANE	464.138	497.25	93.3		91.5	85.2 to 110		
BENZENE	234.192	250.5	93.5		93.5	83.9 to 110		
TOLUENE	478.786	499	95.9		98.9	87.6 to 110		
ETHYL BENZENE	479.668	497.5	96.4		98.4	88.0 to 110		

Sample: WG283710-4 **Spikelot:** IH442862
QC Type: BS **Raw File:**
Analysis date 05/14/14 18:38:29 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1410.30	1489.75	94.7		95.6	85.6 to 110		

ORGANICS QC RECOVERY REPORT

Work Group WG283968

Sample: WG283710-4 **Spikelot:** IH442862
QC Type: BS **Raw File:**
Analysis date 05/14/14 18:38:29 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
N-HEXANE	467.228	497.25	94		92.1	85.2 to 110		
BENZENE	234.981	250.5	93.8		93.8	83.9 to 110		
TOLUENE	472.117	499	94.6		97.5	87.6 to 110		
ETHYL BENZENE	487.072	497.5	97.9		99.9	88.0 to 110		

Sample: WG283710-5 **Spikelot:** IH442862
QC Type: BSD **Raw File:**
Analysis date 05/14/14 18:53:18 **Approval Status:** NEED
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1420.69	1489.75	95.4		96.3	85.6 to 110	-.939	-10 to 10.0
N-HEXANE	468.387	497.25	94.2		92.3	85.2 to 110	-.871	-10 to 10.0
BENZENE	236.021	250.5	94.2		94.2	83.9 to 110	-.746	-10 to 10.0
TOLUENE	483.730	499	96.9		99.9	87.6 to 110	-1.01	-10 to 10.0
ETHYL BENZENE	484.910	497.5	97.5		99.5	88.0 to 110	-1.11	-10 to 10.0

Sample: WG283710-5 **Spikelot:** IH442862
QC Type: BSD **Raw File:**
Analysis date 05/14/14 18:53:18 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1425.98	1489.75	95.7		96.7	85.6 to 110	-1.14	-10 to 10.0
BENZENE	237.883	250.5	95		95	83.9 to 110	-1.27	-10 to 10.0
TOLUENE	477.139	499	95.6		98.6	87.6 to 110	-1.12	-10 to 10.0
ETHYL BENZENE	492.626	497.5	99		101	88.0 to 110	-1.1	-10 to 10.0
N-HEXANE	471.683	497.25	94.9		93	85.2 to 110	-.972	-10 to 10.0

Sample: WG283968-4 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 22:50:04 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	697.832	732.4224	95.3	90.0 to 110.				
N-HEXANE	226.109	244.4685	92.5	89.1 to 110.				
BENZENE	115.947	123.1561	94.1	89.4 to 110.				
TOLUENE	235.748	245.3289	96.1	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283968

Sample: WG283968-4 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 22:50:04 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
ETHYL BENZENE	235.043	244.5915	96.1	90.0 to 110.				

Sample: WG283968-4 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 22:50:04 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	699.050	732.4224	95.4	90.0 to 110.				
BENZENE	116.662	123.1561	94.7	89.4 to 110.				
TOLUENE	232.808	245.3289	94.9	90.0 to 110.				
ETHYL BENZENE	238.192	244.5915	97.4	90.0 to 110.				
N-HEXANE	228.617	244.4685	93.5	89.1 to 110.				

Sample: WG283968-5 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 04:00:39 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	704.980	732.4224	96.3	90.0 to 110.				
N-HEXANE	227.114	244.4685	92.9	89.1 to 110.				
BENZENE	116.760	123.1561	94.8	89.4 to 110.				
TOLUENE	237.495	245.3289	96.8	90.0 to 110.				
ETHYL BENZENE	237.217	244.5915	97	90.0 to 110.				

Sample: WG283968-5 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 04:00:39 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	706.749	732.4224	96.5	90.0 to 110.				
BENZENE	117.032	123.1561	95	89.4 to 110.				
TOLUENE	234.621	245.3289	95.6	90.0 to 110.				
ETHYL BENZENE	241.057	244.5915	98.6	90.0 to 110.				
N-HEXANE	229.643	244.4685	93.9	89.1 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283968

Sample: WG283968-6 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 04:44:56 **Approval Status:** YES
Instrument: HP32A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	705.497	732.4224	96.3	90.0 to 110.				
N-HEXANE	226.996	244.4685	92.9	89.1 to 110.				
BENZENE	116.594	123.1561	94.7	89.4 to 110.				
TOLUENE	237.728	245.3289	96.9	90.0 to 110.				
ETHYL BENZENE	237.544	244.5915	97.1	90.0 to 110.				

Sample: WG283968-6 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 04:44:56 **Approval Status:** YES
Instrument: HP32B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	707.027	732.4224	96.5	90.0 to 110.				
N-HEXANE	229.811	244.4685	94	89.1 to 110.				
BENZENE	117.483	123.1561	95.4	89.4 to 110.				
TOLUENE	235.461	245.3289	96	90.0 to 110.				
ETHYL BENZENE	241.185	244.5915	98.6	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283973

Sample: WG283973-1 **Spikelot:** IH442682-3
QC Type: DLS **Raw File:**
Analysis date 05/14/14 17:04:26 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	6.73247	6.1568	109	70.0 to 130.				
TOLUENE	2.14394	2.0623	104	70.0 to 130.				
ETHYL BENZENE	2.23788	2.0561	109	70.0 to 130.				
N-HEXANE	1.78063	2.055	86.6	70.0 to 130.				
BENZENE	1.01060	1.0353	97.6	70.0 to 130.				

Sample: WG283973-1 **Spikelot:** IH442682-3
QC Type: DLS **Raw File:**
Analysis date 05/14/14 17:04:26 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	6.88043	6.1568	112	70.0 to 130.				
TOLUENE	2.17287	2.0623	105	70.0 to 130.				
ETHYL BENZENE	2.25161	2.0561	110	70.0 to 130.				
N-HEXANE	1.75263	2.055	85.3	70.0 to 130.				
BENZENE	1.01158	1.0353	97.7	70.0 to 130.				

Sample: WG283973-3 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:27:30 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	765.232	732.4224	104	90.0 to 110.				
N-HEXANE	227.926	244.4685	93.2	89.1 to 110.				
BENZENE	116.460	123.1561	94.6	89.4 to 110.				
TOLUENE	248.124	245.3289	101	90.0 to 110.				
ETHYL BENZENE	254.590	244.5915	104	90.0 to 110.				

Sample: WG283973-3 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:27:30 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	775.854	732.4224	106	90.0 to 110.				
N-HEXANE	227.028	244.4685	92.9	89.1 to 110.				
BENZENE	116.641	123.1561	94.7	89.4 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283973

Sample: WG283973-3 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:27:30 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
TOLUENE	251.604	245.3289	103	90.0 to 110.				
ETHYL BENZENE	258.293	244.5915	106	90.0 to 110.				

Sample: WG283695-3 **Spikelot:** NA
QC Type: MBLANK **Raw File:**
Analysis date 05/14/14 18:14:10 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE(FRONT)	0	<15						
XYLENE(BACK)	0	<15						
BENZENE(FRONT)	0	<2						
BENZENE(BACK)	0	<2						
ETHYL BENZENE(FRONT)	0	<5						
ETHYL BENZENE(BACK)	0	<5						
N-HEXANE(FRONT)	0	<5						
N-HEXANE(BACK)	0	<5						
TOLUENE(FRONT)	0	<5						
TOLUENE(BACK)	0	<5						

Sample: WG283695-4 **Spikelot:** IH442862
QC Type: BS **Raw File:**
Analysis date 05/14/14 19:00:41 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1521.55	1489.75	102		105	86.5 to 110		
N-HEXANE	469.285	497.25	94.4		91.6	82.7 to 110		
BENZENE	233.706	250.5	93.3		93.3	84.5 to 110		
TOLUENE	497.513	499	99.7		97.7	83.7 to 110		
ETHYL BENZENE	514.473	497.5	103		100	83.2 to 110		

Sample: WG283695-4 **Spikelot:** IH442862
QC Type: BS **Raw File:**
Analysis date 05/14/14 19:00:41 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1543.40	1489.75	104		107	86.5 to 110		

ORGANICS QC RECOVERY REPORT

Work Group WG283973

Sample: WG283695-4 **Spikelot:** IH442862
QC Type: BS **Raw File:**
Analysis date 05/14/14 19:00:41 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
N-HEXANE	465.325	497.25	93.6		90.9	82.7 to 110		
BENZENE	234.421	250.5	93.6		93.6	84.5 to 110		
TOLUENE	504.691	499	101		99.2	83.7 to 110		
ETHYL BENZENE	522.314	497.5	105		102	83.2 to 110		

Sample: WG283695-5 **Spikelot:** IH442862
QC Type: BSD **Raw File:**
Analysis date 05/14/14 19:24:06 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1514.81	1489.75	102		105	86.5 to 110	0	-12.3 to 11.9
N-HEXANE	468.978	497.25	94.3		91.6	82.7 to 110	0	-11.7 to 11.6
BENZENE	232.823	250.5	92.9		92.9	84.5 to 110	.43	-11.8 to 11.2
TOLUENE	495.272	499	99.3		97.3	83.7 to 110	.41	-11.9 to 11.7
ETHYL BENZENE	512.438	497.5	103		100	83.2 to 110	0	-12.2 to 11.8

Sample: WG283695-5 **Spikelot:** IH442862
QC Type: BSD **Raw File:**
Analysis date 05/14/14 19:24:06 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1535.02	1489.75	103		106	86.5 to 110	.939	-12.3 to 11.9
N-HEXANE	464.586	497.25	93.4		90.7	82.7 to 110	.22	-11.7 to 11.6
BENZENE	233.490	250.5	93.2		93.2	84.5 to 110	.428	-11.8 to 11.2
TOLUENE	502.275	499	101		98.7	83.7 to 110	.505	-11.9 to 11.7
ETHYL BENZENE	519.772	497.5	104		101	83.2 to 110	.985	-12.2 to 11.8

Sample: WG283973-4 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 01:36:31 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	752.402	732.4224	103	90.0 to 110.				
N-HEXANE	228.861	244.4685	93.6	89.1 to 110.				
BENZENE	116.461	123.1561	94.6	89.4 to 110.				
TOLUENE	246.566	245.3289	101	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283973

Sample: WG283973-4 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 01:36:31 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
ETHYL BENZENE	250.569	244.5915	102	90.0 to 110.				

Sample: WG283973-4 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 01:36:31 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	766.772	732.4224	105	90.0 to 110.				
N-HEXANE	227.894	244.4685	93.2	89.1 to 110.				
BENZENE	116.702	123.1561	94.8	89.4 to 110.				
TOLUENE	250.148	245.3289	102	90.0 to 110.				
ETHYL BENZENE	255.509	244.5915	104	90.0 to 110.				

Sample: WG283973-5 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 09:44:53 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	758.535	732.4224	104	90.0 to 110.				
N-HEXANE	229.964	244.4685	94.1	89.1 to 110.				
BENZENE	117.108	123.1561	95.1	89.4 to 110.				
TOLUENE	248.132	245.3289	101	90.0 to 110.				
ETHYL BENZENE	252.580	244.5915	103	90.0 to 110.				

Sample: WG283973-5 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 09:44:53 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	773.088	732.4224	106	90.0 to 110.				
N-HEXANE	228.720	244.4685	93.6	89.1 to 110.				
BENZENE	117.206	123.1561	95.2	89.4 to 110.				
TOLUENE	251.471	245.3289	103	90.0 to 110.				
ETHYL BENZENE	257.273	244.5915	105	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283973

Sample: WG283973-6 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 10:54:33 **Approval Status:** YES
Instrument: HP41A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	759.887	732.4224	104	90.0 to 110.				
N-HEXANE	230.288	244.4685	94.2	89.1 to 110.				
BENZENE	117.286	123.1561	95.2	89.4 to 110.				
TOLUENE	248.621	245.3289	101	90.0 to 110.				
ETHYL BENZENE	253.065	244.5915	103	90.0 to 110.				

Sample: WG283973-6 **Spikelot:** IH443282-2
QC Type: CCV **Raw File:**
Analysis date 05/15/14 10:54:33 **Approval Status:** YES
Instrument: HP41B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	774.545	732.4224	106	90.0 to 110.				
BENZENE	117.369	123.1561	95.3	89.4 to 110.				
TOLUENE	251.956	245.3289	103	90.0 to 110.				
ETHYL BENZENE	257.929	244.5915	105	90.0 to 110.				
N-HEXANE	229.067	244.4685	93.7	89.1 to 110.				

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Center for Toxicology and Environmental Health L.L.C.
SAMPLE CHAIN OF CUSTODY AND ANALYSIS REQUEST FORM

12

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Company	CTEH	CTEH
Address	5120 North Shore Drive North Little Rock, AR 72118	5120 North Shore Drive North Little Rock, AR 72118
Phone	(501)801-8500	(501)801-8500
Fax	(501)801-8501	(501)801-8501
e-mail	labresults@cteh.com [redacted]	lraccounting@cteh.com

CTEH Project #: 166190

Turnaround Requested:
Same Day __Next Day (24 hour) X Norm
__Other (Specify) _____

Complete Data Packet Requested ☒Yes ☐N

Lab Contact Information:
Galson Laboratories
6601 Kirkville Road
E. Syracuse, NY 13057

Client Sample Identification	Other Sample Identification	Sample Size	Units (Check one) ✓L __cm² MIN	Sample Date	Sample Time (for non-air samples)	Initials	NIOSH 1501 BTEX + Hexane									Media: Air
LYVA05067 SKC0001	/	29.37	✓	5/7/14	/	VP								22601		✓
LYVA05067 SKC0002	/	27.56	✓	5/7/14	/	VP										✓
LYVA05067 SKC0003	/	24.02	✓	5/7/14	/	VP										✓
LYVA05067 SKC0004	/	28.97	✓	5/7/14	/	VP										✓
LYVA05067 SKC0005	/	8.59	✓	5/7/14	/	VP										✓
LYVA05067 SKC0006	/	29.04	✓	5/7/14	/	VP										✓
LYVA05067 SKC0007	/	26.55	✓	5/7/14	/	VP										✓
LYVA05067 SKC0008	/	4.22	✓	5/7/14	/	VP										✓
LYVA05067 SKC0009	Blank	/	✓	5/7/14	/	VP										✓
/	/	/	/	/	/	/										

Rec'd intact & all accounted for? Yes or No SIL
Rec'd w/custody seals intact? Yes or No NA
Rec'd in light sensitive packaging? Yes or No NA
Rec'd with ice pack? Yes or No SIL
Rec'd temperature compliant? Yes or No SIL

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME	COMMENTS
		Michelle Krause [redacted]	5/12/14 1140	

5120 North Shore Drive
North Little Rock, AR 72118
Phone: (501) 801-8500
Fax: (501) 801-8501
Website: www.cteh.com

Center for Toxicology and Environmental Health L.L.C.
SAMPLE CHAIN OF CUSTODY AND ANALYSIS REQUEST FORM

D

	Send Report To:	Send Invoice To:
Name		Accounts Payable
Company	CTEH	CTEH
Address	5120 North Shore Drive North Little Rock, AR 72118	5120 North Shore Drive North Little Rock, AR 72118
Phone	(501)801-8500	(501)801-8500
Fax	(501)801-8501	(501)801-8501
e-mail	labresults@cteh.com [redacted]	lraccounting@cteh.com

CTEH Project #: 166190

Turnaround Requested:
Same Day __Next Day (24 hour) X Norm
__Other (Specify) _____

Complete Data Packet Requested ☒Yes ☐N

Lab Contact Information:
Galson Laboratories
6601 Kirkville Road
E. Syracuse, NY 13057

Client Sample Identification	Other Sample Identification	Sample Size	Units (Check one) __L __cm² MIN	Sample Date	Sample Time (for non-air samples)	Initials	NIOSH 1501 BTEX + Hexane								Media: Air	
LVVA05067 WD8943	WD8943	729	✓	5/7/14	/	KP	✓							3520		✓
LVVA05067 WD8790	WD8790	731	✓	5/7/14	/	KP	✓									✓
LVVA05067 WD8988	WD8988	738	✓	5/7/14	/	KP	✓									✓
LVVA05067 WD8761	WD8761	739	✓	5/7/14	/	KP	✓									✓
LVVA05067 WD8939	WD8939	730	✓	5/7/14	/	KP	✓									✓
LVVA05067 WD8924	WD8924	735	✓	5/7/14	/	KP	✓									✓
LVVA05067 WD8842	WD8842	750	✓	5/7/14	/	KP	✓									✓
LVVA05067 WD8942	WD8942	741	✓	5/7/14	/	KP	✓									✓
LVVA05067 WD8253	Blank	—	✓	5/7/14	/	KP	✓									✓

Rec'd intact & all accounted for? Yes or No SL
Rec'd w/custody seals intact? Yes or No NA
Rec'd in light sensitive packaging? Yes or No NA
Rec'd with ice pack? Yes or No SL
Rec'd temperature compliant? Yes or No SL

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME	COMMENTS
		Michelle Krause [redacted]	5/12/14 1140	

Mr. JT Wilson
Center for Toxicology & Env. Health LLC
2000 Anders Lane
Kemah, TX 77565

May 19, 2014

Lynchburg, VA

DOH ELAP #11626
AIHA-LAP #100324

Account# 15330

Login# L318348

Dear Mr. Wilson:

Enclosed are the analytical results for the samples received by our laboratory on May 12, 2014. 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. Unless otherwise requested, all samples will be discarded 14 days from the date of this report, with the exception of IOMs, which will be cleaned and disposed of after seven calendar days.

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

Please contact Caroline Hudson 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)

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

LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832230

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508WD8941 **Lab ID : L318348-10** **Time : 595 Minutes**
Date Sampled : 05/08/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.09	<0.03
Ethylbenzene	5	<5	<5	<5	<0.3	<0.07
n-Hexane	5	<5	<5	<5	<0.3	<0.07
Toluene	5	<5	<5	<5	<0.3	<0.07
Xylene	15	<15	<15	<15	<0.95	<0.22

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832230

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508WD9098 **Lab ID : L318348-11** **Time : 732 Minutes**
Date Sampled : 05/08/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.06
n-Hexane	5	<5	<5	<5	<0.2	<0.06
Toluene	5	<5	<5	<5	<0.2	<0.06
Xylene	15	<15	<15	<15	<0.77	<0.18

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832230

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508WD9075 **Lab ID : L318348-12** **Time : 728 Minutes**
Date Sampled : 05/08/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.06
n-Hexane	5	<5	<5	<5	<0.2	<0.06
Toluene	5	<5	<5	<5	<0.2	<0.06
Xylene	15	<15	<15	<15	<0.78	<0.18

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832230

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508WD8876 **Lab ID : L318348-13** **Time : 726 Minutes**
Date Sampled : 05/08/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.06
n-Hexane	5	<5	<5	<5	<0.2	<0.06
Toluene	5	<5	<5	<5	<0.2	<0.06
Xylene	15	<15	<15	<15	<0.78	<0.18

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832230

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508WD9093 **Lab ID : L318348-14** **Time : 596 Minutes**
Date Sampled : 05/08/14 **Date Analyzed : 05/14/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.09	<0.03
Ethylbenzene	5	<5	<5	<5	<0.3	<0.07
n-Hexane	5	<5	<5	<5	<0.3	<0.07
Toluene	5	<5	<5	<5	<0.3	<0.07
Xylene	15	<15	<15	<15	<0.95	<0.22

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832230

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508WD8786 **Lab ID : L318348-15** **Time : 737 Minutes**
Date Sampled : 05/08/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.06
n-Hexane	5	<5	<5	<5	<0.2	<0.06
Toluene	5	<5	<5	<5	<0.2	<0.06
Xylene	15	<15	<15	<15	<0.77	<0.18

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

LABORATORY ANALYSIS REPORT

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Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832230

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508WD9074 **Lab ID : L318348-16** **Time : 717 Minutes**
Date Sampled : 05/08/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.06
n-Hexane	5	<5	<5	<5	<0.2	<0.06
Toluene	5	<5	<5	<5	<0.2	<0.06
Xylene	15	<15	<15	<15	<0.79	<0.18

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

LABORATORY ANALYSIS REPORT

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FAX: (315) 437-0571
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Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832230

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508WD8275 **Lab ID : L318348-17** **Time : NA**
Date Sampled : 05/08/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	NA	NA
Ethylbenzene	5	<5	<5	<5	NA	NA
n-Hexane	5	<5	<5	<5	NA	NA
Toluene	5	<5	<5	<5	NA	NA
Xylene	15	<15	<15	<15	NA	NA

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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	LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832230

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508WD8920 **Lab ID : L318348-18** **Time : 475 Minutes**
Date Sampled : 05/08/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.1	<0.04
Ethylbenzene	5	<5	<5	<5	<0.4	<0.09
n-Hexane	5	<5	<5	<5	<0.3	<0.09
Toluene	5	<5	<5	<5	<0.3	<0.09
Xylene	15	<15	<15	<15	<1.2	<0.28

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

Collection Media : M3M-3520

Submitted by: ARE
Approved by : nkp
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832169

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508SKC001 **Lab ID : L318348-1** **Air Volume : 26.44 Liter**
Date Sampled : 05/08/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.57	<0.13

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832169

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508SKC002 **Lab ID : L318348-2** **Air Volume : 31.55 Liter**
Date Sampled : 05/08/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.06	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.04
Toluene	5	<5	<5	<5	<0.2	<0.04
Xylene	15	<15	<15	<15	<0.48	<0.11

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832169

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508SKC003 **Lab ID : L318348-3** **Air Volume : 30.13 Liter**
Date Sampled : 05/08/14 **Date Analyzed : 05/15/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.50	<0.12

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832169

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508SKC004 **Lab ID : L318348-4** **Air Volume : 29.70 Liter**
Date Sampled : 05/08/14 **Date Analyzed : 05/16/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.07	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.51	<0.12

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832169

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508SKC005 **Lab ID : L318348-5** **Air Volume : 25.69 Liter**
Date Sampled : 05/08/14 **Date Analyzed : 05/16/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.08	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.05
n-Hexane	5	<5	<5	<5	<0.2	<0.05
Toluene	5	<5	<5	<5	<0.2	<0.05
Xylene	15	<15	<15	<15	<0.59	<0.14

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832169

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508SKC006 **Lab ID : L318348-6** **Air Volume : 3.61 Liter**
Date Sampled : 05/08/14 **Date Analyzed : 05/16/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.6	<0.2
Ethylbenzene	5	<5	<5	<5	<1	<0.3
n-Hexane	5	<5	<5	<5	<1	<0.4
Toluene	5	<5	<5	<5	<1	<0.4
Xylene	15	<15	<15	<15	<4.2	<0.97

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832169

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508SKC007 **Lab ID : L318348-7** **Air Volume : 31.36 Liter**
Date Sampled : 05/08/14 **Date Analyzed : 05/16/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.06	<0.02
Ethylbenzene	5	<5	<5	<5	<0.2	<0.04
n-Hexane	5	<5	<5	<5	<0.2	<0.04
Toluene	5	<5	<5	<5	<0.2	<0.04
Xylene	15	<15	<15	<15	<0.48	<0.11

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832169

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508SKC008 **Lab ID : L318348-8** **Air Volume : 14.54 Liter**
Date Sampled : 05/08/14 **Date Analyzed : 05/16/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	<0.1	<0.04
Ethylbenzene	5	<5	<5	<5	<0.4	<0.08
n-Hexane	5	<5	<5	<5	<0.3	<0.1
Toluene	5	<5	<5	<5	<0.4	<0.09
Xylene	15	<15	<15	<15	<1.0	<0.24

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

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LABORATORY ANALYSIS REPORT

Client : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received : 12-MAY-14
Date Analyzed : 14-MAY-14 - 16-MAY-14
Report ID : 832169

Account No.: 15330
Login No. : L318348

Client ID : LYVA0508SKC009 **Lab ID : L318348-9** **Air Volume : NA**
Date Sampled : 05/08/14 **Date Analyzed : 05/16/14**

Parameter	LOQ ug	Front ug	Back ug	Total ug	Conc mg/m3	ppm
Benzene	2	<2	<2	<2	NA	NA
Ethylbenzene	5	<5	<5	<5	NA	NA
n-Hexane	5	<5	<5	<5	NA	NA
Toluene	5	<5	<5	<5	NA	NA
Xylene	15	<15	<15	<15	NA	NA

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

Collection Media : 226-01

Submitted by: ARE
Approved by : dnf
Date : 19-MAY-14 NYS DOH # : 11626
QC by: Tom Burgess

< -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 LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.

GALSON LABORATORIES

LABORATORY FOOTNOTE REPORT

Client Name : CSX Transportation
Site : Lynchburg, VA

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Date Sampled : 08-MAY-14
Date Received: 12-MAY-14
Date Analyzed: 14-MAY-14 - 16-MAY-14

Account No.: 15330
Login No. : L318348

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

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 preceeding 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.

L318348 (Report ID: 832169):
Benzene - Total ug corrected for a desorption efficiency of 100%.
Ethylbenzene - Total ug corrected for a desorption efficiency of 98%.
Toluene - Total ug corrected for a desorption efficiency of 97%.
Xylene - Total ug corrected for a desorption efficiency of 99%.
n-Hexane - Total ug corrected for a desorption efficiency of 102%.
SOPs: GC-SOP-12(6), GC-SOP-16(12), GC-SOP-8(11)

Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2). The estimated uncertainty applies to the media, technology, and SOP referenced in this report and does not account for the uncertainty associated with the sampling process.

Parameter	Accuracy	Mean Recovery
Benzene	+/-6.7%	94%
Ethylbenzene	+/-7.1%	98.6%
Toluene	+/-6.8%	97.9%
Xylene	+/-6.9%	96%
n-Hexane	+/-6.4%	94.8%

Parameter	Method	PEL
Benzene	mod. NIOSH 1501; GC/FID	1 ppm (TWA)
Ethylbenzene	mod. NIOSH 1501; GC/FID	100 ppm (TWA)
Toluene	mod. NIOSH 1501/OSHA 111; GC/FID	200 ppm (TWA)
Xylene	mod. NIOSH 1501; GC/FID	100 ppm (TWA)
n-Hexane	mod. NIOSH 1500; GC/FID	500 ppm (TWA)

L318348 (Report ID: 832230):
Benzene - Total ug corrected for a desorption efficiency of 100%.
Ethylbenzene - Total ug corrected for a desorption efficiency of 103%.
Toluene - Total ug corrected for a desorption efficiency of 102%.
Xylene - Total ug corrected for a desorption efficiency of 97%.
n-Hexane - Total ug corrected for a desorption efficiency of 103%.
Please note that back media results above the LOQ have been multiplied by a factor of 2.2 in all "total ug" calculations (as specified in the 3M method).
SOPs: GC-SOP-12(6), GC-SOP-16(12), GC-SOP-9(9)

< -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

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LABORATORY FOOTNOTE REPORT

Client Name : CSX Transportation
Site : Lynchburg, VA

Date Sampled : 08-MAY-14
Date Received: 12-MAY-14
Date Analyzed: 14-MAY-14 - 16-MAY-14

Account No.: 15330
Login No. : L318348

Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2). The estimated uncertainty applies to the media, technology, and SOP referenced in this report and does not account for the uncertainty associated with the sampling process.

Parameter	Accuracy	Mean Recovery
Benzene	+/-6.4%	94.1%
Ethylbenzene	+/-7.2%	94%
Toluene	+/-6.5%	93.4%
Xylene	+/-7.7%	98.1%
n-Hexane	+/-7.9%	94.5%

Parameter	Method	PEL
Benzene	mod. NIOSH 1501; GC/FID BADGE	1 ppm (TWA)
Ethylbenzene	mod. NIOSH 1501; GC/FID BADGE	100 ppm (TWA)
Toluene	mod. NIOSH 1501/OSHA 111; GC/FID BADGE	200 ppm (TWA)
Xylene	mod. NIOSH 1501; GC/FID BADGE	100 ppm (TWA)
n-Hexane	mod. NIOSH 1500; GC/FID BADGE	500 ppm (TWA)

< -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	

ORGANICS QC RECOVERY REPORT

Work Group WG284113

Sample: WG284113-1 **Spikelot:** IH444122-6
QC Type: DLS **Raw File:**
Analysis date 05/15/14 20:52:06 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	5.87422	6.1644	95.3	70.0 to 130.				
BENZENE	.983719	1.0365	94.9	70.0 to 130.				
TOLUENE	1.95148	2.0648	94.5	70.0 to 130.				
ETHYL BENZENE	2.00723	2.0586	97.5	70.0 to 130.				
N-HEXANE	1.79690	2.0576	87.3	70.0 to 130.				

Sample: WG284113-1 **Spikelot:** IH444122-6
QC Type: DLS **Raw File:**
Analysis date 05/15/14 20:52:06 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	6.04046	6.1644	98	70.0 to 130.				
TOLUENE	1.88765	2.0648	91.4	70.0 to 130.				
ETHYL BENZENE	1.95845	2.0586	95.1	70.0 to 130.				
N-HEXANE	1.92429	2.0576	93.5	70.0 to 130.				
BENZENE	1.01529	1.0365	97.9	70.0 to 130.				

Sample: WG284113-3 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/15/14 21:06:33 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	719.206	732.4224	98.2	90.0 to 110.				
N-HEXANE	230.638	244.4685	94.3	89.1 to 110.				
BENZENE	119.773	123.1561	97.3	89.4 to 110.				
TOLUENE	241.025	245.3289	98.2	90.0 to 110.				
ETHYL BENZENE	244.647	244.5915	100	90.0 to 110.				

Sample: WG284113-3 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/15/14 21:06:33 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	704.710	732.4224	96.2	90.0 to 110.				
N-HEXANE	232.579	244.4685	95.1	89.1 to 110.				
BENZENE	118.420	123.1561	96.2	89.4 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG284113

Sample: WG284113-3 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/15/14 21:06:33 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
TOLUENE	238.283	245.3289	97.1	90.0 to 110.				
ETHYL BENZENE	237.695	244.5915	97.2	90.0 to 110.				

Sample: WG283804-3 **Spikelot:** NA
QC Type: MBLANK **Raw File:**
Analysis date 05/15/14 21:35:30 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE(FRONT)	0	<15						
XYLENE(BACK)	0	<15						
ETHYL BENZENE(FRONT)	0	<5						
ETHYL BENZENE(BACK)	0	<5						
TOLUENE(FRONT)	0	<5						
TOLUENE(BACK)	0	<5						
BENZENE(FRONT)	0	<2						
BENZENE(BACK)	0	<2						
N-HEXANE(FRONT)	0	<5						
N-HEXANE(BACK)	0	<5						

Sample: WG283804-4 **Spikelot:** IH444122
QC Type: BS **Raw File:**
Analysis date 05/15/14 22:04:20 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1396.12	1489.75	93.7		94.7	85.6 to 110		
N-HEXANE	458.115	497.25	92.1		90.3	85.2 to 110		
BENZENE	233.494	250.5	93.2		93.2	83.9 to 110		
TOLUENE	469.125	499	94		96.9	87.6 to 110		
ETHYL BENZENE	478.281	497.5	96.1		98.1	88.0 to 110		

Sample: WG283804-4 **Spikelot:** IH444122
QC Type: BS **Raw File:**
Analysis date 05/15/14 22:04:20 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1363.84	1489.75	91.5		92.5	85.6 to 110		

ORGANICS QC RECOVERY REPORT

Work Group WG284113

Sample: WG283804-4 **Spikelot:** IH444122
QC Type: BS **Raw File:**
Analysis date 05/15/14 22:04:20 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
N-HEXANE	462.135	497.25	92.9		91.1	85.2 to 110		
BENZENE	231.165	250.5	92.3		92.3	83.9 to 110		
TOLUENE	464.088	499	93		95.9	87.6 to 110		
ETHYL BENZENE	465.084	497.5	93.5		95.4	88.0 to 110		

Sample: WG283804-5 **Spikelot:** IH444122
QC Type: BSD **Raw File:**
Analysis date 05/15/14 22:18:40 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1409.06	1489.75	94.6		95.5	85.6 to 110	-.841	-10 to 10.0
N-HEXANE	458.643	497.25	92.2		90.4	85.2 to 110	-.111	-10 to 10.0
BENZENE	234.251	250.5	93.5		93.5	83.9 to 110	-.321	-10 to 10.0
TOLUENE	472.365	499	94.7		97.6	87.6 to 110	-.72	-10 to 10.0
ETHYL BENZENE	482.613	497.5	97		99	88.0 to 110	-.913	-10 to 10.0

Sample: WG283804-5 **Spikelot:** IH444122
QC Type: BSD **Raw File:**
Analysis date 05/15/14 22:18:40 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1377.76	1489.75	92.5		93.4	85.6 to 110	-.968	-10 to 10.0
N-HEXANE	462.458	497.25	93		91.2	85.2 to 110	-.11	-10 to 10.0
BENZENE	231.767	250.5	92.5		92.5	83.9 to 110	-.216	-10 to 10.0
TOLUENE	468.230	499	93.8		96.7	87.6 to 110	-.831	-10 to 10.0
ETHYL BENZENE	469.859	497.5	94.4		96.4	88.0 to 110	-1.04	-10 to 10.0

Sample: WG284113-4 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/16/14 02:09:07 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	720.706	732.4224	98.4	90.0 to 110.				
N-HEXANE	231.470	244.4685	94.7	89.1 to 110.				
BENZENE	120.344	123.1561	97.7	89.4 to 110.				
TOLUENE	241.852	245.3289	98.6	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG284113

Sample: WG284113-4 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/16/14 02:09:07 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
ETHYL BENZENE	245.005	244.5915	100	90.0 to 110.				

Sample: WG284113-4 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/16/14 02:09:07 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	704.526	732.4224	96.2	90.0 to 110.				
N-HEXANE	233.112	244.4685	95.4	89.1 to 110.				
BENZENE	118.752	123.1561	96.4	89.4 to 110.				
TOLUENE	239.070	245.3289	97.4	90.0 to 110.				
ETHYL BENZENE	238.087	244.5915	97.3	90.0 to 110.				

Sample: WG284113-5 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/16/14 07:11:59 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	726.783	732.4224	99.2	90.0 to 110.				
N-HEXANE	230.268	244.4685	94.2	89.1 to 110.				
BENZENE	120.084	123.1561	97.5	89.4 to 110.				
TOLUENE	242.781	245.3289	99	90.0 to 110.				
ETHYL BENZENE	246.655	244.5915	101	90.0 to 110.				

Sample: WG284113-5 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/16/14 07:11:59 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	712.337	732.4224	97.3	90.0 to 110.				
N-HEXANE	231.961	244.4685	94.9	89.1 to 110.				
BENZENE	118.450	123.1561	96.2	89.4 to 110.				
TOLUENE	239.926	245.3289	97.8	90.0 to 110.				
ETHYL BENZENE	240.397	244.5915	98.3	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG284113

Sample: WG284113-6 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/16/14 07:55:08 **Approval Status:** YES
Instrument: HP42A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	724.148	732.4224	98.9	90.0 to 110.				
N-HEXANE	231.094	244.4685	94.5	89.1 to 110.				
BENZENE	119.987	123.1561	97.4	89.4 to 110.				
TOLUENE	241.523	245.3289	98.4	90.0 to 110.				
ETHYL BENZENE	245.563	244.5915	100	90.0 to 110.				

Sample: WG284113-6 **Spikelot:** IH443282-4
QC Type: CCV **Raw File:**
Analysis date 05/16/14 07:55:08 **Approval Status:** YES
Instrument: HP42B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	706.435	732.4224	96.5	90.0 to 110.				
N-HEXANE	232.831	244.4685	95.2	89.1 to 110.				
BENZENE	118.339	123.1561	96.1	89.4 to 110.				
TOLUENE	238.798	245.3289	97.3	90.0 to 110.				
ETHYL BENZENE	238.527	244.5915	97.5	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283966

Sample: WG283966-1 **Spikelot:** IH443282-6
QC Type: DLS **Raw File:**
Analysis date 05/14/14 17:32:56 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	6.22195	6.1027	102	70.0 to 130.				
TOLUENE	2.05949	2.0441	101	70.0 to 130.				
ETHYL BENZENE	2.04221	2.038	100	70.0 to 130.				
N-HEXANE	1.76376	2.037	86.6	70.0 to 130.				
BENZENE	1.01929	1.0262	99.3	70.0 to 130.				

Sample: WG283966-1 **Spikelot:** IH443282-6
QC Type: DLS **Raw File:**
Analysis date 05/14/14 17:32:56 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	6.17790	6.1027	101	70.0 to 130.				
TOLUENE	2.04148	2.0441	99.9	70.0 to 130.				
ETHYL BENZENE	2.00188	2.038	98.2	70.0 to 130.				
N-HEXANE	1.73429	2.037	85.1	70.0 to 130.				
BENZENE	1.04117	1.0262	101	70.0 to 130.				

Sample: WG283966-3 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:55:29 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	721.319	733.241	98.4	90.0 to 110.				
N-HEXANE	235.543	244.7418	96.2	89.1 to 110.				
BENZENE	118.280	123.2938	95.9	89.4 to 110.				
TOLUENE	241.206	245.6031	98.2	90.0 to 110.				
ETHYL BENZENE	238.818	244.8648	97.5	90.0 to 110.				

Sample: WG283966-3 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:55:29 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	726.334	733.241	99.1	90.0 to 110.				
BENZENE	118.355	123.2938	96	89.4 to 110.				
TOLUENE	241.680	245.6031	98.4	90.0 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283966

Sample: WG283966-3 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/14/14 17:55:29 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
ETHYL BENZENE	238.694	244.8648	97.5	90.0 to 110.				
N-HEXANE	236.457	244.7418	96.6	89.1 to 110.				

Sample: WG283807-3 **Spikelot:** NA
QC Type: MBLANK **Raw File:**
Analysis date 05/14/14 18:40:49 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE(FRONT)	0	<15						
XYLENE(BACK)	0	<15						
BENZENE(FRONT)	0	<2						
BENZENE(BACK)	0	<2						
ETHYL BENZENE(FRONT)	0	<5						
ETHYL BENZENE(BACK)	0	<5						
N-HEXANE(FRONT)	0	<5						
N-HEXANE(BACK)	0	<5						
TOLUENE(FRONT)	0	<5						
TOLUENE(BACK)	0	<5						

Sample: WG283807-4 **Spikelot:** IH443282
QC Type: BS **Raw File:**
Analysis date 05/14/14 19:26:01 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1458.81	1489.75	97.9		101	86.5 to 110		
N-HEXANE	478.746	497.25	96.3		93.5	82.7 to 110		
BENZENE	236.575	250.5	94.4		94.4	84.5 to 110		
TOLUENE	487.228	499	97.6		95.7	83.7 to 110		
ETHYL BENZENE	489.706	497.5	98.4		95.6	83.2 to 110		

Sample: WG283807-4 **Spikelot:** IH443282
QC Type: BS **Raw File:**
Analysis date 05/14/14 19:26:01 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1463.75	1489.75	98.3		101	86.5 to 110		

ORGANICS QC RECOVERY REPORT

Work Group WG283966

Sample: WG283807-4 **Spikelot:** IH443282
QC Type: BS **Raw File:**
Analysis date 05/14/14 19:26:01 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
N-HEXANE	481.022	497.25	96.7		93.9	82.7 to 110		
BENZENE	236.503	250.5	94.4		94.4	84.5 to 110		
TOLUENE	488.190	499	97.8		95.9	83.7 to 110		
ETHYL BENZENE	489.160	497.5	98.3		95.5	83.2 to 110		

Sample: WG283807-5 **Spikelot:** IH443282
QC Type: BSD **Raw File:**
Analysis date 05/14/14 19:48:39 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1442.56	1489.75	96.8		99.8	86.5 to 110	1.2	-12.3 to 11.
N-HEXANE	473.619	497.25	95.2		92.5	82.7 to 110	1.08	-11.7 to 11.
BENZENE	233.843	250.5	93.4		93.4	84.5 to 110	1.06	-11.8 to 11.
TOLUENE	481.787	499	96.6		94.7	83.7 to 110	1.05	-11.9 to 11.
ETHYL BENZENE	484.431	497.5	97.4		94.5	83.2 to 110	1.16	-12.2 to 11.

Sample: WG283807-5 **Spikelot:** IH443282
QC Type: BSD **Raw File:**
Analysis date 05/14/14 19:48:39 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	1449.32	1489.75	97.3		100	86.5 to 110	.995	-12.3 to 11.
N-HEXANE	475.680	497.25	95.7		92.9	82.7 to 110	1.07	-11.7 to 11.
BENZENE	233.919	250.5	93.4		93.4	84.5 to 110	1.06	-11.8 to 11.
TOLUENE	482.594	499	96.7		94.8	83.7 to 110	1.15	-11.9 to 11.
ETHYL BENZENE	483.793	497.5	97.2		94.4	83.2 to 110	1.16	-12.2 to 11.

Sample: WG283966-4 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/15/14 01:50:51 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	716.222	733.241	97.7	90.0 to 110.				
N-HEXANE	233.220	244.7418	95.3	89.1 to 110.				
BENZENE	117.019	123.2938	94.9	89.4 to 110.				
TOLUENE	238.872	245.6031	97.3	90.0 to 110.				

Sample: WG283966-4 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/15/14 01:50:51 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
ETHYL BENZENE	237.035	244.8648	96.8	90.0 to 110.				

Sample: WG283966-4 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/15/14 01:50:51 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	719.269	733.241	98.1	90.0 to 110.				
N-HEXANE	233.811	244.7418	95.5	89.1 to 110.				
BENZENE	116.890	123.2938	94.8	89.4 to 110.				
TOLUENE	239.258	245.6031	97.4	90.0 to 110.				
ETHYL BENZENE	236.839	244.8648	96.7	90.0 to 110.				

Sample: WG283966-5 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/15/14 09:45:35 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	712.659	733.241	97.2	90.0 to 110.				
N-HEXANE	235.543	244.7418	96.2	89.1 to 110.				
BENZENE	117.705	123.2938	95.5	89.4 to 110.				
TOLUENE	238.488	245.6031	97.1	90.0 to 110.				
ETHYL BENZENE	235.857	244.8648	96.3	90.0 to 110.				

Sample: WG283966-5 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/15/14 09:45:35 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	716.089	733.241	97.7	90.0 to 110.				
BENZENE	117.586	123.2938	95.4	89.4 to 110.				
TOLUENE	239.283	245.6031	97.4	90.0 to 110.				
ETHYL BENZENE	235.896	244.8648	96.3	90.0 to 110.				
N-HEXANE	236.306	244.7418	96.6	89.1 to 110.				

ORGANICS QC RECOVERY REPORT

Work Group WG283966

Sample: WG283966-6 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/15/14 11:38:34 **Approval Status:** YES
Instrument: HP30A

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	716.192	733.241	97.7	90.0 to 110.				
N-HEXANE	233.785	244.7418	95.5	89.1 to 110.				
BENZENE	117.367	123.2938	95.2	89.4 to 110.				
TOLUENE	239.261	245.6031	97.4	90.0 to 110.				
ETHYL BENZENE	237.025	244.8648	96.8	90.0 to 110.				

Sample: WG283966-6 **Spikelot:** IH444122-1
QC Type: CCV **Raw File:**
Analysis date 05/15/14 11:38:34 **Approval Status:** YES
Instrument: HP30B

Parameter	Found	True	Rec.	Limits	DE Rec.	Limits	RPD	Limits
XYLENE	719.522	733.241	98.1	90.0 to 110.				
BENZENE	117.377	123.2938	95.2	89.4 to 110.				
TOLUENE	239.881	245.6031	97.7	90.0 to 110.				
ETHYL BENZENE	237.126	244.8648	96.8	90.0 to 110.				
N-HEXANE	234.713	244.7418	95.9	89.1 to 110.				

5120 North Shore Drive
North Little Rock, AR 72118
Phone: (501) 801-8500
Fax: (501) 801-8501
Website: www.cteh.com

Center for Toxicology and Environmental Health L.L.C.
SAMPLE CHAIN OF CUSTODY AND ANALYSIS REQUEST FORM

10

	Send Report To:	Send Invoice To:
Name		Accounts Payable
Company	CTEH	CTEH
Address	5120 North Shore Drive North Little Rock, AR 72118	5120 North Shore Drive North Little Rock, AR 72118
Phone	(501)801-8500	(501)801-8500
Fax	(501)801-8501	(501)801-8501
e-mail	labresults@cteh.com [redacted]	lraccounting@cteh.com

CTEH Project #: 166198

Turnaround Requested:
Same Day __Next Day (24 hour) X Norm
__Other (Specify) _____

Complete Data Packet Requested ☒Yes ☐N

Lab Contact Information:
Galson Laboratories
6601 Kirkville Road
E. Syracuse, NY 13057

Client Sample Identification	Other Sample Identification	Sample Size	Units (Check one) ✓L __cm² MIN	Sample Date	Sample Time (for non-air samples)	Initials	NIOSH 1501 BTEX + Hexane							Media: Air
LVVA05068SKC0001		26.44	✓	5/8/14		VP	✓				3206-01			✓
LVVA05068SKC0002		31.55	✓	5/8/14		VP	✓							✓
LVVA05068SKC0003		30.13	✓	5/8/14		VP	✓							✓
LVVA05068SKC0004		29.76	✓	5/8/14		VP	✓							✓
LVVA05068SKC0005		25.69	✓	5/8/14		VP	✓							✓
LVVA05068SKC0006		3.61	✓	5/8/14		VP	✓							✓
LVVA05068SKC0007		31.36	✓	5/8/14		VP	✓							✓
LVVA05068SKC0008		141.54	✓	5/8/14		VP	✓							✓
LVVA05068SKC0009	Blank		✓	5/8/14		VP	✓							✓

Rec'd intact & all accounted for? Yes or No SL
Rec'd w/custody seals intact? Yes or No NA
Rec'd in light sensitive packaging? Yes or No NA
Rec'd with ice pack? Yes or No SL
Rec'd temperature compliant? Yes or No SL

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME	COMMENTS
		Michelle Krause [redacted]	5/12/14 1140	

5120 North Shore Drive
North Little Rock, AR 72118
Phone: (501) 801-8500
Fax: (501) 801-8501
Website: www.cteh.com

Center for Toxicology and Environmental Health L.L.C.
SAMPLE CHAIN OF CUSTODY AND ANALYSIS REQUEST FORM

	Send Report To:	Send Invoice To:
Name		Accounts Payable
Company	CTEH	CTEH
Address	5120 North Shore Drive North Little Rock, AR 72118	5120 North Shore Drive North Little Rock, AR 72118
Phone	(501)801-8500	(501)801-8500
Fax	(501)801-8501	(501)801-8501
e-mail	labresults@cteh.com [redacted]	lraccounting@cteh.com

CTEH Project #: 106198

Turnaround Requested:
Same Day __Next Day (24 hour) X Norm
__Other (Specify) _____

Complete Data Packet Requested ☒Yes ☐N

Lab Contact Information:
Galson Laboratories
6601 Kirkville Road
E. Syracuse, NY 13057

Client Sample Identification	Other Sample Identification	Sample Size	Units (Check one) __L __cm² MIN	Sample Date	Sample Time (for non-air samples)	Initials	NIOSH 1501 BTEX + Hexane								
LVA0505 WD8941	WD8941	595	✓	5/8/14	/	KP	✓								✓
LVA0505/WD9089 *	WD9089	732	✓	5/8/14	/	KP	✓								✓
LVA0505 WD9075	WD9075	728	✓	5/8/14	/	KP	✓								✓
LVA0505 WD8876	WD8876	726	✓	5/8/14	/	KP	✓								✓
LVA0505 WD9093	WD9093	596	✓	5/8/14	/	KP	✓								✓
LVA0505 WD8786	WD8786	737	✓	5/8/14	/	KP	✓								✓
LVA0505 WD9074	WD9074	717	✓	5/8/14	/	KP	✓								✓
~~LVA0505 WD9074~~			✓	5/8/14	/	KP									
LVA0505 WD8275	Blank		✓	5/8/14	/	KP	✓								✓
LVA0505 WD8920	WD8920	475	✓	5/8/14	/	KP	✓								✓

Rec'd intact & all accounted for? Yes or No SL
Rec'd w/custody seals intact? Yes or No NA
Rec'd in light sensitive packaging? Yes or No NA
Rec'd with ice pack? Yes or No SL
Rec'd temperature compliant? Yes or No SL

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME	COMMENTS
				* ID is WD9098 (SL)
		Michelle Krause [redacted]	5/12/14 1140	

Appendix F

Data Verification Reports

Data Verification Report (Level 2)

Project 106190: Lynchburg, VA - CSX Derailment

Client: CTEH

Report #: L318349 Date: May 29, 2014

Environmental Data Professional, LLC
1432 Watkins Street • Lake Charles, LA 70601 • phone: 337-540-0036 • fax: 337-478-6061

Disclaimer:

The review performed and reported herein is based on specifications and procedures presented to eDATApro with the associated data package. Any qualifications or review not specified with package requirements was based on USEPA National Functional Guidelines for Inorganic and Organic Data Review.

Information contained in this report is based solely on the hardcopy and/or electronic deliverables that were submitted to eDATApro. eDATApro reserves the rights to modify or change the report if new information is presented or if this report is determined to be inaccurate or incomplete.

The following parameters were reviewed during the verification process:

Chain-of-Custody (COC): Completeness and sample custody

Holding time: Compare collection date versus preparation and/or analysis date

Blank Contamination: Laboratory and field blanks

Matrix/Precision/Recovery: Surrogates, Internal Standards, Duplicates, Blank spike and blank spike duplicate samples (when applicable)

Standards: Detection limit standard and continuing calibration verification (when applicable)

Reviewed by: Anthony J Duhon

Signature: [redacted]

INTRODUCTION:

Project Name: 106190 - Lynchburg, VA - CSX Derailment
Laboratory: Galson Laboratories
Laboratory Package No.: L318349
Matrix: Air

Environmental Data Professional, LLC (eDATApro) received one electronic Level II data package containing the results for sixteen field samples and three field blanks. Level II verification was performed on the data utilizing *USEPA National Functional Guidelines for Organic Data Review* and the analytical methods.

The following samples were reviewed:

Sample ID	Lab ID	Collection Date	Analyses
LYVA0505SKC001	L318349-1	05/05/2014	[1-3]
LYVA0505SKC002	L318349-2	05/05/2014	[1-3]
LYVA0505SKC003	L318349-3	05/05/2014	[1-3]
LYVA0505SKC004	L318349-4	05/05/2014	[1-3]
LYVA0505SKC005	L318349-5	05/05/2014	[1-3]
LYVA0505SKC006	L318349-6	05/05/2014	[1-3]
LYVA0505SKC007	L318349-7	05/05/2014	[1-3]
LYVA0505SKC008	L318349-8	05/05/2014	[1-3]
LYVA0505SKC009	L318349-9	05/05/2014	[1-3]
LYVA0505NF5700	L318349-10	05/05/2014	[1-3]
LYVA0505NF5709	L318349-11	05/05/2014	[1-3]
LYVA0505NF5640	L318349-12	05/05/2014	[1-3]
LYVA0505NF5773	L318349-13	05/05/2014	[1-3]
LYVA0505NF6028	L318349-14	05/05/2014	[1-3]
LYVA0505NF5655	L318349-15	05/05/2014	[1-3]
LYVA0505NF6022	L318349-16	05/05/2014	[1-3]
LYVA0505NF5994	L318349-17	05/05/2014	[1-3]
LYVA0505NE8235	L318349-18	05/05/2014	[1-3]
LYVA0505NE8184	L318349-19	05/05/2014	[1-3]

Analyses Performed Codes:

[1] Benzene, Ethylbenzene & Xylenes (mod. NIOSH 1501; GC/FID BADGE)
[2] Toluene (mod. NIOSH 1501/OSHA 111; GC/FID BADGE)
[3] n-Hexane (mod. NIOSH 1500; GC/FID BADGE)

DATA REVIEW FINDINGS SUMMARY

I. General Package:

A complete data package was received from the laboratory. No resubmissions were necessary.

The chain-of-custody (COC) was not relinquished by the sample collection team. Custody of samples from the date of collection, 5/5/2014, to receipt at the laboratory, 5/12/2014, could not be verified.

The laboratory noted that blank sample LYVA0505NE8184 was received but not recorded on the COC. This sample was analyzed by the laboratory and reviewed by eDATApro.

The laboratory noted that the back part of sample LYVA0505NF5994 was received uncapped. Any potential effect on the sample results could not be determined.

II. Benzene, Ethylbenzene & Xylenes - mod. NIOSH 1501:

Laboratory results were reported in concentration units of PPM and UG.

All quality assurance and quality control (QA/QC) components presented by the laboratory satisfied method and data review acceptance criteria. No data qualifications were necessary.

III. Toluene - mod. NIOSH 1501/OSHA 111:

Laboratory results were reported in concentration units of PPM and UG.

All quality assurance and quality control (QA/QC) components presented by the laboratory satisfied method and data review acceptance criteria. No data qualifications were necessary.

IV. n-Hexane - mod. NIOSH 1500:

Laboratory results were reported in concentration units of PPM and UG.

All quality assurance and quality control (QA/QC) components presented by the laboratory satisfied method and data review acceptance criteria. No data qualifications were necessary.

Appendix I
Form 1 Data (Qualified)

Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505SKC001** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-1** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID									
N-HEXANE	05/05/2014	05/16/2014 3:21	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/16/2014 3:21	1	0.09	0.09	U	0.09	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID									
TOLUENE	05/05/2014	05/16/2014 3:21	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/16/2014 3:21	1	0.09	0.09	U	0.09	U	PPM
Method: mod. NIOSH 1501; GC/FID									
BENZENE	05/05/2014	05/16/2014 3:21	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/16/2014 3:21	1	0.04	0.04	U	0.04	U	PPM
ETHYL BENZENE	05/05/2014	05/16/2014 3:21	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/16/2014 3:21	1	0.08	0.08	U	0.08	U	PPM
XYLENE	05/05/2014	05/16/2014 3:21	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/16/2014 3:21	1	0.23	0.23	U	0.23	U	PPM

DF = Dilution Factor RL = Reporting Limit

* = Modified by Validation

U = Non-Detect J = Estimated R = Rejected

eDATApro

Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505NF5700** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-10** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID BADGE									
N-HEXANE	05/05/2014	05/15/2014 3:43	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/15/2014 3:43	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID BADGE									
TOLUENE	05/05/2014	05/15/2014 3:43	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/15/2014 3:43	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501; GC/FID BADGE									
BENZENE	05/05/2014	05/15/2014 3:43	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/15/2014 3:43	1	0.02	0.02	U	0.02	U	PPM
ETHYL BENZENE	05/05/2014	05/15/2014 3:43	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/15/2014 3:43	1	0.05	0.05	U	0.05	U	PPM
XYLENE	05/05/2014	05/15/2014 3:43	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/15/2014 3:43	1	0.15	0.15	U	0.15	U	PPM

DF = Dilution Factor RL = Reporting Limit

* = Modified by Validation

U = Non-Detect J = Estimated R = Rejected

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Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505NF5709** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-11** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID BADGE									
N-HEXANE	05/05/2014	05/15/2014 4:29	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/15/2014 4:29	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID BADGE									
TOLUENE	05/05/2014	05/15/2014 4:29	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/15/2014 4:29	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501; GC/FID BADGE									
BENZENE	05/05/2014	05/15/2014 4:29	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/15/2014 4:29	1	0.02	0.02	U	0.02	U	PPM
ETHYL BENZENE	05/05/2014	05/15/2014 4:29	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/15/2014 4:29	1	0.05	0.05	U	0.05	U	PPM
XYLENE	05/05/2014	05/15/2014 4:29	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/15/2014 4:29	1	0.16	0.16	U	0.16	U	PPM

DF = Dilution Factor RL = Reporting Limit

* = Modified by Validation

U = Non-Detect J = Estimated R = Rejected

Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505NF5640** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-12** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID BADGE									
N-HEXANE	05/05/2014	05/15/2014 5:14	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/15/2014 5:14	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID BADGE									
TOLUENE	05/05/2014	05/15/2014 5:14	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/15/2014 5:14	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501; GC/FID BADGE									
BENZENE	05/05/2014	05/15/2014 5:14	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/15/2014 5:14	1	0.02	0.02	U	0.02	U	PPM
ETHYL BENZENE	05/05/2014	05/15/2014 5:14	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/15/2014 5:14	1	0.05	0.05	U	0.05	U	PPM
XYLENE	05/05/2014	05/15/2014 5:14	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/15/2014 5:14	1	0.16	0.16	U	0.16	U	PPM

DF = Dilution Factor RL = Reporting Limit

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U = Non-Detect J = Estimated R = Rejected

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Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505NF5773** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-13** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID BADGE									
N-HEXANE	05/05/2014	05/15/2014 5:59	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/15/2014 5:59	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID BADGE									
TOLUENE	05/05/2014	05/15/2014 5:59	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/15/2014 5:59	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501; GC/FID BADGE									
BENZENE	05/05/2014	05/15/2014 5:59	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/15/2014 5:59	1	0.02	0.02	U	0.02	U	PPM
ETHYL BENZENE	05/05/2014	05/15/2014 5:59	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/15/2014 5:59	1	0.05	0.05	U	0.05	U	PPM
XYLENE	05/05/2014	05/15/2014 5:59	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/15/2014 5:59	1	0.16	0.16	U	0.16	U	PPM

DF = Dilution Factor RL = Reporting Limit

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U = Non-Detect J = Estimated R = Rejected

Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505NF6028** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-14** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID BADGE									
N-HEXANE	05/05/2014	05/15/2014 6:44	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/15/2014 6:44	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID BADGE									
TOLUENE	05/05/2014	05/15/2014 6:44	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/15/2014 6:44	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501; GC/FID BADGE									
BENZENE	05/05/2014	05/15/2014 6:44	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/15/2014 6:44	1	0.02	0.02	U	0.02	U	PPM
ETHYL BENZENE	05/05/2014	05/15/2014 6:44	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/15/2014 6:44	1	0.05	0.05	U	0.05	U	PPM
XYLENE	05/05/2014	05/15/2014 6:44	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/15/2014 6:44	1	0.15	0.15	U	0.15	U	PPM

DF = Dilution Factor RL = Reporting Limit

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Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505NF5655** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-15** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID BADGE									
N-HEXANE	05/05/2014	05/15/2014 7:29	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/15/2014 7:29	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID BADGE									
TOLUENE	05/05/2014	05/15/2014 7:29	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/15/2014 7:29	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501; GC/FID BADGE									
BENZENE	05/05/2014	05/15/2014 7:29	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/15/2014 7:29	1	0.02	0.02	U	0.02	U	PPM
ETHYL BENZENE	05/05/2014	05/15/2014 7:29	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/15/2014 7:29	1	0.05	0.05	U	0.05	U	PPM
XYLENE	05/05/2014	05/15/2014 7:29	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/15/2014 7:29	1	0.14	0.14	U	0.14	U	PPM

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Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505NF6022** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-16** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID BADGE									
N-HEXANE	05/05/2014	05/15/2014 8:15	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/15/2014 8:15	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID BADGE									
TOLUENE	05/05/2014	05/15/2014 8:15	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/15/2014 8:15	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501; GC/FID BADGE									
BENZENE	05/05/2014	05/15/2014 8:15	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/15/2014 8:15	1	0.02	0.02	U	0.02	U	PPM
ETHYL BENZENE	05/05/2014	05/15/2014 8:15	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/15/2014 8:15	1	0.05	0.05	U	0.05	U	PPM
XYLENE	05/05/2014	05/15/2014 8:15	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/15/2014 8:15	1	0.15	0.15	U	0.15	U	PPM

DF = Dilution Factor RL = Reporting Limit

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Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505NF5994** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-17** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID BADGE									
N-HEXANE	05/05/2014	05/15/2014 9:00	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/15/2014 9:00	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID BADGE									
TOLUENE	05/05/2014	05/15/2014 9:00	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/15/2014 9:00	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501; GC/FID BADGE									
BENZENE	05/05/2014	05/15/2014 9:00	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/15/2014 9:00	1	0.02	0.02	U	0.02	U	PPM
ETHYL BENZENE	05/05/2014	05/15/2014 9:00	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/15/2014 9:00	1	0.05	0.05	U	0.05	U	PPM
XYLENE	05/05/2014	05/15/2014 9:00	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/15/2014 9:00	1	0.16	0.16	U	0.16	U	PPM

DF = Dilution Factor RL = Reporting Limit

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Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505NE8235** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-18** Lab Code: **GALSON**

Sample Type: **Field Blank**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID BADGE									
N-HEXANE	05/05/2014	05/15/2014 10:08	1	5	5	U	5	U	UG
Method: mod. NIOSH 1501/OSHA 111; GC/FID BADGE									
TOLUENE	05/05/2014	05/15/2014 10:08	1	5	5	U	5	U	UG
Method: mod. NIOSH 1501; GC/FID BADGE									
BENZENE	05/05/2014	05/15/2014 10:08	1	2	2	U	2	U	UG
ETHYL BENZENE	05/05/2014	05/15/2014 10:08	1	5	5	U	5	U	UG
XYLENE	05/05/2014	05/15/2014 10:08	1	15	15	U	15	U	UG

DF = Dilution Factor RL = Reporting Limit

* = Modified by Validation

U = Non-Detect J = Estimated R = Rejected

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Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505NE8184** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-19** Lab Code: **GALSON**

Sample Type: **Field Blank**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID BADGE									
N-HEXANE	05/05/2014	05/15/2014 10:53	1	5	5	U	5	U	UG
Method: mod. NIOSH 1501/OSHA 111; GC/FID BADGE									
TOLUENE	05/05/2014	05/15/2014 10:53	1	5	5	U	5	U	UG
Method: mod. NIOSH 1501; GC/FID BADGE									
BENZENE	05/05/2014	05/15/2014 10:53	1	2	2	U	2	U	UG
ETHYL BENZENE	05/05/2014	05/15/2014 10:53	1	5	5	U	5	U	UG
XYLENE	05/05/2014	05/15/2014 10:53	1	15	15	U	15	U	UG

DF = Dilution Factor RL = Reporting Limit

* = Modified by Validation

U = Non-Detect J = Estimated R = Rejected

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Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505SKC002** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-2** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID									
N-HEXANE	05/05/2014	05/16/2014 3:50	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/16/2014 3:50	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID									
TOLUENE	05/05/2014	05/16/2014 3:50	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/16/2014 3:50	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501; GC/FID									
BENZENE	05/05/2014	05/16/2014 3:50	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/16/2014 3:50	1	0.02	0.02	U	0.02	U	PPM
ETHYL BENZENE	05/05/2014	05/16/2014 3:50	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/16/2014 3:50	1	0.04	0.04	U	0.04	U	PPM
XYLENE	05/05/2014	05/16/2014 3:50	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/16/2014 3:50	1	0.12	0.12	U	0.12	U	PPM

DF = Dilution Factor RL = Reporting Limit

* = Modified by Validation

U = Non-Detect J = Estimated R = Rejected

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Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505SKC003** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-3** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID									
N-HEXANE	05/05/2014	05/16/2014 4:18	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/16/2014 4:18	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID									
TOLUENE	05/05/2014	05/16/2014 4:18	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/16/2014 4:18	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501; GC/FID									
BENZENE	05/05/2014	05/16/2014 4:18	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/16/2014 4:18	1	0.02	0.02	U	0.02	U	PPM
ETHYL BENZENE	05/05/2014	05/16/2014 4:18	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/16/2014 4:18	1	0.04	0.04	U	0.04	U	PPM
XYLENE	05/05/2014	05/16/2014 4:18	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/16/2014 4:18	1	0.12	0.12	U	0.12	U	PPM

DF = Dilution Factor RL = Reporting Limit

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U = Non-Detect J = Estimated R = Rejected

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Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505SKC004** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-4** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID									
N-HEXANE	05/05/2014	05/16/2014 4:47	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/16/2014 4:47	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID									
TOLUENE	05/05/2014	05/16/2014 4:47	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/16/2014 4:47	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501; GC/FID									
BENZENE	05/05/2014	05/16/2014 4:47	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/16/2014 4:47	1	0.02	0.02	U	0.02	U	PPM
ETHYL BENZENE	05/05/2014	05/16/2014 4:47	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/16/2014 4:47	1	0.04	0.04	U	0.04	U	PPM
XYLENE	05/05/2014	05/16/2014 4:47	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/16/2014 4:47	1	0.12	0.12	U	0.12	U	PPM

DF = Dilution Factor RL = Reporting Limit

* = Modified by Validation

U = Non-Detect J = Estimated R = Rejected

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Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505SKC005** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-5** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID									
N-HEXANE	05/05/2014	05/16/2014 5:16	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/16/2014 5:16	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID									
TOLUENE	05/05/2014	05/16/2014 5:16	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/16/2014 5:16	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501; GC/FID									
BENZENE	05/05/2014	05/16/2014 5:16	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/16/2014 5:16	1	0.02	0.02	U	0.02	U	PPM
ETHYL BENZENE	05/05/2014	05/16/2014 5:16	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/16/2014 5:16	1	0.04	0.04	U	0.04	U	PPM
XYLENE	05/05/2014	05/16/2014 5:16	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/16/2014 5:16	1	0.13	0.13	U	0.13	U	PPM

DF = Dilution Factor RL = Reporting Limit

* = Modified by Validation

U = Non-Detect J = Estimated R = Rejected

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Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505SKC006** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-6** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID									
N-HEXANE	05/05/2014	05/16/2014 5:45	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/16/2014 5:45	1	0.09	0.09	U	0.09	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID									
TOLUENE	05/05/2014	05/16/2014 5:45	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/16/2014 5:45	1	0.09	0.09	U	0.09	U	PPM
Method: mod. NIOSH 1501; GC/FID									
BENZENE	05/05/2014	05/16/2014 5:45	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/16/2014 5:45	1	0.04	0.04	U	0.04	U	PPM
ETHYL BENZENE	05/05/2014	05/16/2014 5:45	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/16/2014 5:45	1	0.08	0.08	U	0.08	U	PPM
XYLENE	05/05/2014	05/16/2014 5:45	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/16/2014 5:45	1	0.24	0.24	U	0.24	U	PPM

DF = Dilution Factor RL = Reporting Limit

* = Modified by Validation

U = Non-Detect J = Estimated R = Rejected

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Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505SKC007** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-7** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID									
N-HEXANE	05/05/2014	05/16/2014 6:14	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/16/2014 6:14	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID									
TOLUENE	05/05/2014	05/16/2014 6:14	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/16/2014 6:14	1	0.05	0.05	U	0.05	U	PPM
Method: mod. NIOSH 1501; GC/FID									
BENZENE	05/05/2014	05/16/2014 6:14	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/16/2014 6:14	1	0.02	0.02	U	0.02	U	PPM
ETHYL BENZENE	05/05/2014	05/16/2014 6:14	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/16/2014 6:14	1	0.04	0.04	U	0.04	U	PPM
XYLENE	05/05/2014	05/16/2014 6:14	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/16/2014 6:14	1	0.12	0.12	U	0.12	U	PPM

DF = Dilution Factor RL = Reporting Limit

* = Modified by Validation

U = Non-Detect J = Estimated R = Rejected

eDATApro

Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505SKC008** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-8** Lab Code: **GALSON**

Sample Type: **Site Sample**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID									
N-HEXANE	05/05/2014	05/16/2014 6:43	1	5	5	U	5	U	UG
N-HEXANE	05/05/2014	05/16/2014 6:43	1	0.4	0.4	U	0.4	U	PPM
Method: mod. NIOSH 1501/OSHA 111; GC/FID									
TOLUENE	05/05/2014	05/16/2014 6:43	1	5	5	U	5	U	UG
TOLUENE	05/05/2014	05/16/2014 6:43	1	0.4	0.4	U	0.4	U	PPM
Method: mod. NIOSH 1501; GC/FID									
BENZENE	05/05/2014	05/16/2014 6:43	1	2	2	U	2	U	UG
BENZENE	05/05/2014	05/16/2014 6:43	1	0.2	0.2	U	0 2	U	PPM
ETHYL BENZENE	05/05/2014	05/16/2014 6:43	1	5	5	U	5	U	UG
ETHYL BENZENE	05/05/2014	05/16/2014 6:43	1	0.3	0.3	U	0 3	U	PPM
XYLENE	05/05/2014	05/16/2014 6:43	1	15	15	U	15	U	UG
XYLENE	05/05/2014	05/16/2014 6:43	1	0.9	0.9	U	0 9	U	PPM

DF = Dilution Factor RL = Reporting Limit

* = Modified by Validation

U = Non-Detect J = Estimated R = Rejected

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Form 1 Data Sheet - BTEX

CTEH

Lynchburg, VA - CSX derailment

SDG: L318349

COC Sample ID: **LYVA0505SKC009** Sample Matrix : **A**

Location ID: **NA**

Lab Sample ID: **L318349-9** Lab Code: **GALSON**

Sample Type: **Field Blank**

Parameter Name	Collection Date	Analysis Date	DF	RL	Lab Result	Lab Qualifier	Verified Result	Verified Qualifier	Units
Method: mod. NIOSH 1500; GC/FID									
N-HEXANE	05/05/2014	05/16/2014 7:26	1	5	5	U	5	U	UG
Method: mod. NIOSH 1501/OSHA 111; GC/FID									
TOLUENE	05/05/2014	05/16/2014 7:26	1	5	5	U	5	U	UG
Method: mod. NIOSH 1501; GC/FID									
BENZENE	05/05/2014	05/16/2014 7:26	1	2	2	U	2	U	UG
ETHYL BENZENE	05/05/2014	05/16/2014 7:26	1	5	5	U	5	U	UG
XYLENE	05/05/2014	05/16/2014 7:26	1	15	15	U	15	U	UG

DF = Dilution Factor RL = Reporting Limit

* = Modified by Validation

U = Non-Detect J = Estimated R = Rejected

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Appendix II
Chain of Custody

281608

51[illegible] North Shore Drive
North Little Rock, AR 72118
Phone: (501) 801-8500
Fax: (501) 801-8501
Website: www.cteh.com

Center for Toxicology and Environmental Health L.L.C.
SAMPLE CHAIN OF CUSTODY AND ANALYSIS REQUEST FORM

(9)

	Send Report To:	Send Invoice To:
Name		Accounts Payable
Company	CTEH	CTEH
Address	5120 North Shore Drive North Little Rock, AR 72118	5120 North Shore Drive North Little Rock, AR 72118
Phone	(501)801-8500	(501)801-8500
Fax	(501)801-8501	(501)801-8501
e-mail	labresults@ct[redacted]	[redacted]accounting@cteh.com

CTEH Project #: 106190

Turnaround Requested:
Same Day __Next Day (24 hour) X Norm
__Other (Specify) ______

Complete Data Packet Requested ☒Yes ☐N

Lab Contact Information:
Galson Laboratories
6601 Kirkville Road
E. Syracuse, NY 13057

Client Sample Identification	Other Sample Identification	Sample Size	Units (Check one) ✓L __cm² MIN	Sample Date	Sample Time (for non-air samples)	Initials	NIOSH 1501 BTEX + Hexane		Matrix Air
LYVA0505SKC0001	/	15.28	✓	5/5/14	/	KP	✓	226-01	✓
LYVA0505SKC0002	/	28.84	✓	5/5/14	/	KP	✓		✓
LYVA0505SKC0003	/	28.72	✓	5/5/14	/	KP	✓		✓
LYVA0505SKC0004	/	29.24	✓	5/5/14	/	KP	✓		✓
LYVA0505SKC0005	/	27.20	✓	5/5/14	/	KP	✓		✓
LYVA0505SKC0006	/	14.77	✓	5/5/14	/	KP	✓		✓
LYVA0505SKC0007	/	28.91	✓	5/5/14	/	KP	✓		✓
LYVA0505SKC0008	/	3.90	✓	5/5/14	/	KP	✓		✓
LYVA0505SKC0009	Blank	/	✓	5/5/14	/	KP	✓		✓
						KP			

Rec'd intact & all accounted for? (Yes) or No SK
Rec'd w/custody seals intact? Yes or No NA
Rec'd in light sensitive packaging? Yes or No NA
Rec'd with ice pack? Yes or (No) SK
Rec'd temperature compliant? (Yes) or No SK

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME	COMMENTS
		Michelle Krause [redacted]	5/12/14 1140	

5120 North Shore Drive
North Little Rock, AR 72118
Phone: (501) 801-8500
Fax: (501) 801-8501
Website: www.cteh.com

Center for Toxicology and Environmental Health L.L.C.

SAMPLE CHAIN OF CUSTODY AND ANALYSIS REQUEST FORM

9

	Send Report To:	Send Invoice To:
Name		Accounts Payable
Company	CTEH	CTEH
Address	5120 North Shore Drive North Little Rock, AR 72118	5120 North Shore Drive North Little Rock, AR 72118
Phone	(501)801-8500	(501)801-8500
Fax	(501)801-8501	(501)801-8501
e-mail	labresults@cteh.com [redacted]	raccounting@cteh.com

CTEH Project #: 166198

Turnaround Requested:
Same Day __Next Day (24 hour) ☒ Norm
__Other (Specify) _____

Complete Data Packet Requested ☒ Yes ☐ N

Lab Contact Information:
Galson Laboratories
6601 Kirkville Road
E. Syracuse, NY 13057

Client Sample Identification	Other Sample Identification	Sample Size	Units (Check one) __L __cm² MIN	Sample Date	Sample Time (for non-air samples)	Initials	BTEX + hexane NIOSH 1501	Matrix Air
LYVA05051NF5708	NF5708	885	Min	05/5/14		KP	✓	
LYVA05051NF5709	NF5709	840	Min	5/5/14		KP	✓	
LYVA05051NF5640	NF5640	827	Min	5/5/14		KP	✓	
LYVA05051NF5773	NF5773	820	Min	5/5/14		KP	✓	
LYVA05051NF6028	NF6028	980	Min	5/5/14		KP	✓	
LYVA05051NF5655	NF5655	904	Min	5/5/14		KP	✓	
LYVA05051NF6022	NF6022	850	Min	5/5/14		KP	✓	
LYVA05051NF5994	NF5994	815	Min	5/5/14		KP	✓	
LYVA05051NE8235	Blank			5/5/14		KP	✓	
						KP		

3520

Rec'd intact & all accounted for? Yes or No SK
Rec'd w/custody seals intact? Yes or No NA
Rec'd in light sensitive packaging? Yes or No NA
Rec'd with ice pack? Yes or No SK
Rec'd temperature compliant? Yes or No SK

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME	COMMENTS
				*Recvd NE8184 not on COC Blank SK
		Michelle Krause [redacted]	5/12/14 1140	

Appendix G

MSDS for Bakken Sweet Crude Oil

Safety Data Sheet

Material Name: Bakken Crude Oil
Product Synonym(s): Crude Petroleum, Hydrocarbons of Petroleum

* * * Section 1 - Product and Company Identification * * *

Manufacturer Information

Statoil
6300 Bridge Point Parkway
Building 2, Suite 500
Austin, TX 78730

Phone: 512-427-3300

* * * Section 2 - Hazards Identification * * *

GHS Classification:

Flammable Liquids - Category 2
Carcinogenicity - Category 1B
Specific Target Organ Toxicity Repeat Exposure - Category 2

GHS LABEL ELEMENTS

Symbol(s)

Signal Word

Danger

Hazard Statements

Highly flammable liquid and vapor.
May cause cancer.
May cause damage to organs (liver, kidneys, blood, nervous system, and skin) through prolonged or repeated exposure.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust/fume/gas/mist/vapors/spray

Wear protective gloves/protective clothing/eye protection/face protection.

Response

IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF exposed or concerned: Get medical advice/attention.
In case of fire: Use water spray, fog or fire fighting foam.

Storage

Store in a well-ventilated place. Keep cool.
Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
Not Available	C10 to C49+ isoparaffins	32.5
Not Available	C10 to C49+ cyclic paraffins	19.8
Not Available	C12+ mono-aromatics	8.5
Not Available	Poly aromatic hydrocarbons	4.9
Not Available	C10 to C49+ n paraffins	3.7
Not Available	C16+ di-aromatics	2.8
Not Available	C7 cyclic paraffins	2.6
Not Available	C8 cyclic paraffins	2.3
Not Available	Trimethyl benzenes	2.3
Not Available	Dimethyl naphthalene	1.5
142-82-5	n-Heptane	1
96-37-7	Methylcyclopentane	0.9
111-84-2	Nonane	0.9
Not Available	Dimethyl benzenes	0.9
75-28-5	Isobutane	0.9
111-65-9	Octane	0.9
Not Available	Trimethyl naphthalene	0.9
110-54-3	Hexane	0.9
96-14-0	3-Methylpentane	0.8
592-27-8	2-Methylheptane	0.8
591-76-4	2-Methylhexane	0.8
109-66-0	Pentane	0.8
108-88-3	Toluene	0.8
124-18-5	Decane	0.7
Not Available	Tetramethyl benzenes	0.7
Not Available	Pentamethyl benzenes	0.6
78-78-4	Isopentane	0.6
Not Available	Low level and unidentified hydrocarbons	0.5
107-83-5	2-Methylpentane	0.5

589-34-4	3-Methylhexane	0.5
Not Available	C10 cyclic paraffins	0.5
106-42-3	p-Xylene	0.4
108-38-3	m-Xylene	0.4
589-81-1	Heptane, 3-methyl-	0.4
Not Available	C9 cyclic paraffins	0.4
90-12-0	1-Methylnaphthalene	0.3
Not Available	Decane isomers	0.3
589-53-7	4-Methylheptane	0.2
91-57-6	2-Methylnaphthalene	0.2
74-98-6	Propane	0.2
95-47-6	o-Xylene	0.1
91-20-3	Naphthalene	0.1
100-41-4	Ethylbenzene	0.1
79-29-8	2,3-Dimethylbutane	0.1
71-43-2	Benzene	0.1
584-94-1	2,3-Dimethylhexane	0.1
583-48-2	Hexane, 3,4-dimethyl-	0.1
Not Available	Nonane isomers	0.1

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

First Aid: Skin

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

First Aid: Ingestion

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or Halon.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Firefighters should wear full protective gear.

* * * Section 6 - Accidental Release Measures * * *

Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal.

Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Product may release substantial amounts of flammable vapors and gases (e.g., methane, ethane, and propane), at or below ambient temperature depending on source and process conditions and pressure.

Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection - do not discharge solid water stream patterns into the liquid resulting in splashing.

Prevention of Secondary Hazards

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Handle as a flammable liquid. Keep away from heat, sparks, and open flamel Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Incompatibilities

Keep away from strong oxidizers.

*** Section 8 - Exposure Controls / Personal Protection ***

Component Exposure Limits

n-Heptane (142-82-5)

ACGIH: 400 ppm TWA (listed under Heptane, all isomers)
500 ppm STEL (listed under Heptane, all isomers)
OSHA: 500 ppm TWA; 2000 mg/m3 TWA
NIOSH: 85 ppm TWA; 350 mg/m3 TWA
440 ppm Ceiling (15 min); 1800 mg/m3 Ceiling (15 min)

Octane (111-65-9)

ACGIH: 300 ppm TWA
OSHA: 500 ppm TWA; 2350 mg/m3 TWA
NIOSH: 75 ppm TWA; 350 mg/m3 TWA
385 ppm Ceiling (15 min); 1800 mg/m3 Ceiling (15 min)

Nonane (111-84-2)

ACGIH: 200 ppm TWA
NIOSH: 200 ppm TWA; 1050 mg/m3 TWA

Hexane (110-54-3)

ACGIH: 50 ppm TWA
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 500 ppm TWA; 1800 mg/m3 TWA
NIOSH: 50 ppm TWA; 180 mg/m3 TWA

Isobutane (75-28-5)

ACGIH: 1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)
NIOSH: 800 ppm TWA; 1900 mg/m3 TWA

Toluene (108-88-3)

ACGIH: 20 ppm TWA
OSHA: 200 ppm TWA
300 ppm Ceiling
NIOSH: 100 ppm TWA; 375 mg/m3 TWA
150 ppm STEL; 560 mg/m3 STEL

Pentane (109-66-0)

ACGIH: 600 ppm TWA (listed under Pentane, all isomers)
OSHA: 1000 ppm TWA; 2950 mg/m3 TWA
NIOSH: 120 ppm TWA; 350 mg/m3 TWA
610 ppm Ceiling (15 min); 1800 mg/m3 Ceiling (15 min)

2-Methylhexane (591-76-4)
ACGIH: 400 ppm TWA (listed under Heptane, all isomers)
500 ppm STEL (listed under Heptane, all isomers)

Isopentane (78-78-4)
ACGIH: 600 ppm TWA (listed under Pentane, all isomers)

3-Methylhexane (589-34-4)
ACGIH: 400 ppm TWA (listed under Heptane, all isomers)
500 ppm STEL (listed under Heptane, all isomers)

p-Xylene (106-42-3)
ACGIH: 100 ppm TWA
150 ppm STEL
NIOSH: 100 ppm TWA; 435 mg/m3 TWA
150 ppm STEL; 655 mg/m3 STEL

m-Xylene (108-38-3)
ACGIH: 100 ppm TWA
150 ppm STEL
NIOSH: 100 ppm TWA; 435 mg/m3 TWA
150 ppm STEL; 655 mg/m3 STEL

1-Methylnaphthalene (90-12-0)
ACGIH: 0.5 ppm TWA
Skin - potential significant contribution to overall exposure by the cutaneous route

2-Methylnaphthalene (91-57-6)
ACGIH: 0.5 ppm TWA
Skin - potential significant contribution to overall exposure by the cutaneous route

Propane (74-98-6)
ACGIH: 1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)
OSHA: 1000 ppm TWA; 1800 mg/m3 TWA
NIOSH: 1000 ppm TWA; 1800 mg/m3 TWA

o-Xylene (95-47-6)
ACGIH: 100 ppm TWA
150 ppm STEL
NIOSH: 100 ppm TWA; 435 mg/m3 TWA
150 ppm STEL; 655 mg/m3 STEL

Ethylbenzene (100-41-4)
ACGIH: 20 ppm TWA
OSHA: 100 ppm TWA; 435 mg/m3 TWA
NIOSH: 100 ppm TWA; 435 mg/m3 TWA
125 ppm STEL; 545 mg/m3 STEL

Benzene (71-43-2)

ACGIH: 0.5 ppm TWA
2.5 ppm STEL
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA
10 ppm TWA (applies to industry segments exempt from the benzene standard at 29 CFR 1910.1028); 1 ppm TWA
5 ppm STEL (see 29 CFR 1910.1028)
25 ppm Ceiling
NIOSH: 0.1 ppm TWA
1 ppm STEL

Naphthalene (91-20-3)

ACGIH: 10 ppm TWA
15 ppm STEL
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 10 ppm TWA; 50 mg/m3 TWA
NIOSH: 10 ppm TWA; 50 mg/m3 TWA
15 ppm STEL; 75 mg/m3 STEL

Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Personal Protective Equipment: Respiratory

A NIOSH/ MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

Personal Protective Equipment: Hands

Gloves constructed of nitrile or neoprene are recommended.

Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

*** Section 9 - Physical & Chemical Properties ***

Appearance:	Thick, dark yellow to brown or greenish black	**Odor:**	Moderate, Characteristic
Physical State:	Liquid	**pH:**	Not Determined
Vapor Pressure:	Not Determined	**Vapor Density:**	Not Determined
Boiling Point:	130°F	**Melting Point:**	Not Determined
Solubility (H2O):	Insoluble to slightly soluble	**Specific Gravity:**	0.7601
Evaporation Rate:	Not Determined	**VOC:**	Present per speciated review
Octanol/H2O Coeff.:	Not Determined	**Flash Point:**	<-50°F
Flash Point Method:	Setaflash	**Upper Flammability Limit (UFL):**	Not Determined
Lower Flammability Limit (LFL):	Not Determined	**Burning Rate:**	Not Determined
Auto Ignition:	Not Determined		

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

Incompatible Products

Keep away from strong oxidizers.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

*** Section 11 - Toxicological Information ***

Acute Toxicity

A: General Product Information

Harmful if swallowed.

B: Component Analysis - LD50/LC50

n-Heptane (142-82-5)

Inhalation LC50 Rat 103 g/m3 4 h; Oral LD50 Mouse 5000 mg/kg; Dermal LD50 Rabbit 3000 mg/kg

Octane (111-65-9)

Inhalation LC50 Rat 118 g/m3 4 h; Inhalation LC50 Rat 25260 ppm 4 h

Nonane (111-84-2)

Inhalation LC50 Rat 3200 ppm 4 h

Hexane (110-54-3)

Inhalation LC50 Rat 48000 ppm 4 h; Oral LD50 Rat 25 g/kg; Dermal LD50 Rabbit 3000 mg/kg

Isobutane (75-28-5)

Inhalation LC50 Rat 658 mg/L 4 h

Toluene (108-88-3)
Inhalation LC50 Rat 12.5 mg/L 4 h; Inhalation LC50 Rat >26700 ppm 1 h; Oral LD50 Rat 636 mg/kg; Dermal LD50 Rabbit 8390 mg/kg; Dermal LD50 Rat 12124 mg/kg

Pentane (109-66-0)
Inhalation LC50 Rat 364 g/m3 4 h; Dermal LD50 Rabbit 3000 mg/kg; Oral LD50 Rat >2000 mg/kg

Decane (124-18-5)
Inhalation LC50 Mouse 72300 mg/m3 2 h; Oral LD50 Rat >5000 mg/kg; Dermal LD50 Rat >2000 mg/kg

Isopentane (78-78-4)
Inhalation LC50 Rat 280000 mg/m3 4 h

p-Xylene (106-42-3)
Inhalation LC50 Rat 4550 ppm 4 h; Oral LD50 Rat >3392 mg/kg

m-Xylene (108-38-3)
Oral LD50 Rat 5000 mg/kg; Dermal LD50 Rabbit 14100 µL/kg

1-Methylnaphthalene (90-12-0)
Oral LD50 Rat 1840 mg/kg

2-Methylnaphthalene (91-57-6)
Oral LD50 Rat 1630 mg/kg

Propane (74-98-6)
Inhalation LC50 Rat 658 mg/L 4 h

o-Xylene (95-47-6)
Inhalation LC50 Rat 2180 ppm 4 h; Oral LD50 Rat 3609 mg/kg

Ethylbenzene (100-41-4)
Inhalation LC50 Rat 17.2 mg/L 4 h; Oral LD50 Rat 3500 mg/kg; Dermal LD50 Rabbit 15354 mg/kg

Benzene (71-43-2)
Inhalation LC50 Rat 13050-14380 ppm 4 h; Oral LD50 Rat 1800 mg/kg

Naphthalene (91-20-3)
Inhalation LC50 Rat >340 mg/m3 1 h; Oral LD50 Rat 490 mg/kg; Dermal LD50 Rat >2500 mg/kg; Dermal LD50 Rabbit >20 g/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Contact with eyes may cause moderate to severe irritation.

Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea.

Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity

Some crude oils and crude oil fractions have been positive in mutagenicity studies.

Carcinogenicity

A: General Product Information

May cause cancer.

B: Component Carcinogenicity

Toluene (108-88-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

p-Xylene (106-42-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 71 [1999] (listed under Xylenes) (Group 3 (not classifiable))

m-Xylene (108-38-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 71 [1999] (listed under Xylenes) (Group 3 (not classifiable))

1-Methylnaphthalene (90-12-0)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

2-Methylnaphthalene (91-57-6)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

o-Xylene (95-47-6)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 71 [1999] (listed under Xylenes) (Group 3 (not classifiable))

Ethylbenzene (100-41-4)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
IARC: Monograph 77 [2000] (Group 2B (possibly carcinogenic to humans))

Benzene (71-43-2)

ACGIH: A1 - Confirmed Human Carcinogen
OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA
NIOSH: potential occupational carcinogen
NTP: Known Human Carcinogen (Select Carcinogen)
IARC: Monograph 100F [2012]; Supplement 7 [1987]; Monograph 29 [1982[(Group 1 (carcinogenic to humans))

Naphthalene (91-20-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)
IARC: Monograph 82 [2002] (Group 2B (possibly carcinogenic to humans))

Reproductive Toxicity

This product is not reported to have any reproductive toxicity effects.

Specified Target Organ General Toxicity: Single Exposure

This product is not reported to have any specific target organ general toxicity single exposure effects.

Specified Target Organ General Toxicity: Repeated Exposure

May cause damage to organs (liver, kidneys, blood, nervous system and skin) through prolonged or repeated exposure.

Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

n-Heptane (142-82-5)

Test & Species		Conditions
96 Hr LC50 Cichlid fish	375.0 mg/L	
24 Hr EC50 Daphnia magna	>10 mg/L	

Octane (111-65-9)

Test & Species		Conditions
48 Hr EC50 water flea	0.38 mg/L	

Hexane (110-54-3)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	2.1-2.98 mg/L [flow-through]	
24 Hr EC50 Daphnia magna	>1000 mg/L	

Toluene (108-88-3)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	15.22-19.05 mg/L [flow-through]	1 day old
96 Hr LC50 Pimephales promelas	12.6 mg/L [static]	
96 Hr LC50 Oncorhynchus mykiss	5.89-7.81 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	14.1-17.16 mg/L [static]	
96 Hr LC50 Oncorhynchus mykiss	5.8 mg/L]semi-static]	
96 Hr LC50 Lepomis macrochirus	11.0-15.0 mg/L [static]	
96 Hr LC50 Oryzias latipes	54 mg/L [static]	
96 Hr LC50 Poecilia reticulata	28.2 mg/L [semi-static]	
96 Hr LC50 Poecilia reticulata	50.87-70.34 mg/L [static]	
96 Hr EC50 Pseudokirchneriella subcapitata	>433 mg/L	
72 Hr EC50 Pseudokirchneriella subcapitata	12.5 mg/L [static]	
48 Hr EC50 Daphnia magna	5.46 - 9.83 mg/L [Static]	
48 Hr EC50 Daphnia magna	11.5 mg/L	

Pentane (109-66-0)

Test & Species		Conditions
96 Hr LC50 Oncorhynchus mykiss	9.87 mg/L	
96 Hr LC50 Pimephales promelas	11.59 mg/L	

96 Hr LC50 Lepomis macrochirus	9.99 mg/L
48 Hr EC50 Daphnia magna	9.74 mg/L

Decane (124-18-5)

Test & Species	Conditions
24 Hr EC50 Chlorella vulgaris	0.043 mg/L
48 Hr EC50 Daphnia magna	0.029 mg/L

Isopentane (78-78-4)

Test & Species	Conditions
48 Hr EC50 Daphnia magna	2.3 mg/L

p-Xylene (106-42-3)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	7.2-9.9 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	2.6 mg/L
96 Hr LC50 Oncorhynchus mykiss	2.6 mg/L [static]
96 Hr LC50 Poecilia reticulata	8.8 mg/L [semi-static]
3 Hr EC50 Chlorella vulgaris	105.1 mg/L
72 Hr EC50 Pseudokirchneriella subcapitata	3.2 mg/L [static[
48 Hr EC50 Daphnia magna	3.55 - 6.31 mg/L [Static]

m-Xylene (108-38-3)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	14.3-18 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	8.4 mg/L [semi-static]
96 Hr LC50 Poecilia reticulata	12.9 mg/L [semi-static]
72 Hr EC50 Pseudokirchneriella subcapitata	4.9 mg/L [static]
48 Hr EC50 Daphnia magna	2.81 - 5.0 mg/L [Static]

o-Xylene (95-47-6)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	11.6-22.4 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	11.6-22.4 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	5.59-11.6 mg/L [flow-through]

96 Hr LC50 Poecilia reticulata	12 mg/L
192 Hr EC50 Pseudokirchneriella subcapitata	4.2 mg/L
72 Hr EC50 Pseudokirchneriella subcapitata	4.7 mg/L [static]
48 Hr EC50 Daphnia magna	3.2 mg/L
48 Hr EC50 Daphnia magna	2.61 - 5.59 mg/L [Flow through]
48 Hr EC50 Daphnia magna	0.78 - 2.51 mg/L [Static]

Ethylbenzene (100-41-4)

Test & Species	Conditions
96 Hr LC50 Oncorhynchus mykiss	11.0-18.0 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	4.2 mg/L [semi-static]
96 Hr LC50 Pimephales promelas	7.55-11 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	32 mg/L [static]
96 Hr LC50 Pimephales promelas	9.1-15.6 mg/L [static]
96 Hr LC50 Poecilia reticulata	9.6 mg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	4.6 mg/L
96 Hr EC50 Pseudokirchneriella subcapitata	>438 mg/L
72 Hr EC50 Pseudokirchneriella subcapitata	2.6 - 11.3 mg/L [static]
96 Hr EC50 Pseudokirchneriella subcapitata	1.7 - 7.6 mg/L [static]
48 Hr EC50 Daphnia magna	1.8 - 2.4 mg/L

Benzene (71-43-2)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	10.7-14.7 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	5.3 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	22.49 mg/L [static]
96 Hr LC50 Poecilia reticulata	28.6 mg/L [static]
96 Hr LC50 Pimephales promelas	22330-41160 µg/L [static]
96 Hr LC50 Lepomis macrochirus	70000-142000 µg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	29 mg/L
48 Hr EC50 Daphnia magna	8.76 - 15.6 mg/L [Static]

48 Hr EC50 Daphnia magna	10 mg/L

Naphthalene (91-20-3)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	5.74-6.44 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	1.6 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	0.91-2.82 mg/L [static]
96 Hr LC50 Pimephales promelas	1.99 mg/L [static]
96 Hr LC50 Lepomis macrochirus	31.0265 mg/L [static]
72 Hr EC50 Skeletonema costatum	0.4 mg/L
48 Hr LC50 Daphnia magna	2.16 mg/L
48 Hr EC50 Daphnia magna	1.96 mg/L [Flow through]
48 Hr EC50 Daphnia magna	1.09 - 3.4 mg/L [Static]

Persistence/Degradability

No information available.

Bioaccumulation

No information available.

Mobility in Soil

No information available.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 14 - Transportation Information * * *

DOT Information

Shipping Name: Petroleum Crude Oil
Hazard Class: 3
UN #: 1267
Packing Group: I

* * * Section 15 - Regulatory Information * * *

Regulatory Information

US Federal Regulations

Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Hexane (110-54-3)

CERCLA: 5000 lb final RQ; 2270 kg final RQ

Toluene (108-88-3)

CERCLA: 1000 lb final RQ; 454 kg final RQ

p-Xylene (106-42-3)

CERCLA: 100 lb final RQ; 45.4 kg final RQ

m-Xylene (108-38-3)

CERCLA: 1000 lb final RQ; 454 kg final RQ

o-Xylene (95-47-6)

CERCLA: 1000 lb final RQ; 454 kg final RQ

Ethylbenzene (100-41-4)

SARA 313: 0.1 % de minimis concentration
CERCLA: 1000 lb final RQ; 454 kg final RQ

Benzene (71-43-2)

SARA 313: 0.1 % de minimis concentration
CERCLA: 10 lb final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule); 4.54 kg final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule)

Naphthalene (91-20-3)

SARA 313: 0.1 % de minimis concentration
CERCLA: 100 lb final RQ; 45.4 kg final RQ

State Regulations

A: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
n-Heptane	142-82-5	Yes	Yes	Yes	Yes	Yes	No
Methylcyclopentane	96-37-7	No	Yes	No	Yes	Yes	No
Octane	111-65-9	Yes	Yes	Yes	Yes	Yes	No
Nonane	111-84-2	Yes	Yes	Yes	Yes	Yes	No
Hexane	110-54-3	No	Yes	Yes	Yes	Yes	No
Isobutane	75-28-5	No	Yes	No	Yes	Yes	No
Toluene	108-88-3	Yes	Yes	Yes	Yes	Yes	No
3-Methylpentane	96-14-0	No	Yes	No	No	Yes	No
Pentane	109-66-0	Yes	Yes	Yes	Yes	Yes	No
2-Methylhexane	591-76-4	No	Yes	No	No	Yes	No
Decane	124-18-5	No	No	No	Yes	Yes	No
Isopentane	78-78-4	No	Yes	No	Yes	Yes	No
3-Methylhexane	589-34-4	No	Yes	No	Yes	Yes	No
2-Methylpentane	107-83-5	No	Yes	Yes	Yes	Yes	No
p-Xylene	106-42-3	Yes	Yes	No	Yes	Yes	No
m-Xylene	108-38-3	Yes	Yes	No	Yes	Yes	No
1-Methylnaphthalene	90-12-0	No	Yes	No	Yes	Yes	No
2-Methylnaphthalene	91-57-6	No	No	No	Yes	No	No
Propane	74-98-6	No	Yes	Yes	Yes	Yes	No
o-Xylene	95-47-6	Yes	Yes	No	Yes	Yes	No
Ethylbenzene	100-41-4	Yes	Yes	Yes	Yes	Yes	No
2,3-Dimethylbutane	79-29-8	No	Yes	No	Yes	Yes	No
Benzene	71-43-2	Yes	Yes	Yes	Yes	Yes	No
Naphthalene	91-20-3	Yes	Yes	Yes	Yes	Yes	No
2,3-Dimethylhexane	584-94-1	No	Yes	No	No	Yes	No

WARNING! This product contains a chemical known to the state of California to cause cancer.
WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
n-Heptane	142-82-5	1 %
p-Xylene	106-42-3	0.1 %
Ethylbenzene	100-41-4	0.1 %
Benzene	71-43-2	0.1 %

Additional Regulatory Information

Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
n-Heptane	142-82-5	Yes	DSL	EINECS
Methylcyclopentane	96-37-7	Yes	DSL	EINECS
Octane	111-65-9	Yes	DSL	EINECS
Nonane	111-84-2	Yes	DSL	EINECS
Hexane	110-54-3	Yes	DSL	EINECS
Isobutane	75-28-5	Yes	DSL	EINECS
Toluene	108-88-3	Yes	DSL	EINECS
3-Methylpentane	96-14-0	Yes	DSL	EINECS
Pentane	109-66-0	Yes	DSL	EINECS
2-Methylhexane	591-76-4	Yes	DSL	EINECS
2-Methylheptane	592-27-8	No	No	EINECS
Decane	124-18-5	Yes	DSL	EINECS
Isopentane	78-78-4	Yes	DSL	EINECS
3-Methylhexane	589-34-4	Yes	NDSL	EINECS
2-Methylpentane	107-83-5	Yes	DSL	EINECS
p-Xylene	106-42-3	Yes	DSL	EINECS
m-Xylene	108-38-3	Yes	DSL	EINECS
Heptane, 3-methyl-	589-81-1	Yes	NDSL	EINECS
1-Methylnaphthalene	90-12-0	Yes	DSL	EINECS
2-Methylnaphthalene	91-57-6	Yes	DSL	EINECS
Propane	74-98-6	Yes	DSL	EINECS
4-Methylheptane	589-53-7	No	No	EINECS
o-Xylene	95-47-6	Yes	DSL	EINECS
Ethylbenzene	100-41-4	Yes	DSL	EINECS
Hexane, 3,4-dimethyl-	583-48-2	Yes	NDSL	EINECS
2,3-Dimethylbutane	79-29-8	Yes	DSL	EINECS
Benzene	71-43-2	Yes	DSL	EINECS
Naphthalene	91-20-3	Yes	DSL	EINECS
2,3-Dimethylhexane	584-94-1	No	No	EINECS

*** Section 16 - Other Information ***

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

Literature References

None

End of Sheet

Safety Data Sheet

1. Identification

Product Name:	Crude Oil (Sweet)
Chemical Family:	Petroleum Hydrocarbon Mixture
Manufacturers Name:	Whiting Oil and Gas Corporation
Address:	1700 Broadway, Suite 2300 Denver, Colorado 80290
Product Use:	Feedstock for petroleum and petrochemical refining.
Phone Number for Information:	(303) 837-1661
Emergency Phone Number:	(800) 424-9300 (Chemtrec)

Crude oil is a complex mixture of paraffinic, cycloparaffinic and aromatic hydrocarbons covering carbon numbers ranging from C1 to over C60. It is amber to black in color. Crude oil contains small amounts of sulfur, nitrogen and oxygen compounds as well as trace amounts of heavy metals.

2. Hazard Identification

Crude oil is extremely flammable and can cause eye, skin, gastrointestinal, and respiratory irritation. Inhalation may cause dizziness, nausea, or headache. More serious health effects can occur if crude oil in inhaled or swallowed.

Crude oil may contain variable amounts of benzene and n-hexane. Long-term exposure to these materials has been shown to lead to systemic toxicity such leukemia and peripheral neurotoxicity.

DANGER!
FLAMMABLE LIQUID

MAY CONTAIN BENZENE WHICH CAN CAUSE CANCER OR BE TOXIC TO BLOOD-FORMING ORGANS. ASPIRATION OF LIQUID INTO THE LUNGS CAN PRODUCE CHEMICAL PNEUMONIA OR EVEN DEATH.

NO SMOKING!
KEEP AWAY FROM HEAT/SPARKS/OPEN FLAMES/HOT SURFACES. WEAR PROTECTIVE GLOVES, CLOTHING AND EYE WEAR WHEN HANDLING. AVOID RELEASE INTO THE ENVIRONMENT.

Globally Harmonized System (GHS) Information

Physical Hazards Classification
Flammable Liquids, Category 2

Health Hazards Classification
Acute Toxicity (Skin/Dermal), Category 3
Skin Corrosion/irritation, Category 2
Serious eye damage/eye irritation, Category 2a
Carcinogenicity, Category 1B
Specific Target organ toxicity – single exposure, Category 3 (narcotic effects)
Specific Target organ toxicity – repeated exposure, Category 2 (bone marrow, liver, thymus)
Aspiration hazard, Category 1

Environmental Hazards Classification
Acute Toxicity to the aquatic environment, Category 3
Chronic Toxicity to the aquatic environment, Category 3

GHS Label Information

Symbols:

Signal Word: Danger

Hazard Statements:	**Precautionary Statements:**
Physical Hazards Flammable liquid and vapor **Health Hazards** May cause cancer May be fatal if swallowed and enters airways Causes eye irritation May cause drowsiness or dizziness May cause damage to organs through prolonged or repeated exposure Causes mild skin irritation **Environmental Hazards** Harmful to aquatic life Harmful to aquatic life with long lasting effects	**Prevention** Keep away from heat/sparks/open flames/hot surfaces – no smoking Keep container tightly closed Ground/bond container and receiving equipment Use explosion proof electrical/ventilation/lighting equipment Use only non-sparking tools Take precautionary measures against static discharge Wear protective gloves/protective clothing/eye protection/face protection Obtain special instructions before use Do not handle until all safety precautions have been read and understood Wash hands thoroughly after handling Do not breathe vapors Do not eat, drink or smoke when using this product Use only outdoors or in a well-ventilated area Avoid release to the environment **Response** IF ON SKIN (or hair): Remove all contaminated clothing. Rinse skin with water/shower In case of fire: use appropriate extinguishing media If exposed or concerned: Get medical attention or advice IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

	If irritation persists get medical advice/attention IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Collect spillage IF SWALLOWED: Immediately call a poison control center or doctor/physician Do not induce vomiting **Storage** Store locked up Store in a well-ventilated place. Keep container tightly closed. **Disposal** Dispose of contents/container in accordance with local/regional/national/international regulations

3. Composition/Information on Ingredients

COMPOSITION	CAS NUMBER	PERCENT
Crude Oil	8002-05-9	100
May Contain Variable Amounts of:		
Natural Gas	8005-14-2	—
Benzene	71-43-2	—
N-Hexane	110-54-3	—

4. First Aid Measures

Eye Contact
Immediately flush eyes while holding eyelids open, with large amounts of clean, low-pressure tepid water for at least 15 minutes. If symptoms, irritation or injury persists, worsen or develop, seek medical attention.

Skin Contact
Remove contaminated clothing/shoes, wipe excess from skin. Immediately flush skin with water for 15 minutes then wash with soap and water. If illness or adverse symptoms develop or irritation persists, seek medial attention. Discard contaminated leather goods.

Inhalation
Remove victim to fresh air and provide oxygen if breathing labored, shallow, or difficult. Rescuer must wear appropriate supplied air respirator to remove worker from contaminated area to fresh air. Give artificial respiration if victim is not breathing. Seek medical attention immediately*.

Ingestion
Do not induce vomiting. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Seek medical attention.*

Note to Physician
*If more than 2.0 ML per KG has been ingested and emesis has not occurred, vomiting should be induced with supervision. Keep victim's head below hips to prevent aspiration. If symptoms such as loss of gag reflex, convulsions or unconsciousness occur before emesis, gastric lavage using a cuffed endotracheal tube should be considered.

Aggravated Medical Conditions
Preexisting eye, skin, and respiratory disorders may be aggravated by exposure to crude oil.

5. Fire-Fighting Measures

Extinguishing Media
For small fires, class B fire extinguishing media can be used. Use water fog, foam, dry chemical or CO_2. Do not use a direct stream of water. Product will float and can be reignited on surface of water.

Special Fire Fighting Procedures and Precautions
Warning: Flammable. Clear fire area of unprotected personnel. Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots) including a positive pressure NIOSH approved self-contained breathing apparatus (SCBA). Cool containers exposed to fire with water.

Unusual Fire Explosion Hazards
Container exposed to intense heat from fires should be cooled with water to prevent vapor pressure buildup which could result in container rupture (bleve). Container areas exposed to direct flame contact should be cooled with large quantities of water as needed to prevent weakening of container structure. Sulfur oxides and hydrogen sulfide, both of which are toxic, may be released upon combustion.

NFPA Ratings
Health – 2
Flammability – 3
Reactivity – 0
Other – 0

Key: Least-0; Slight-1; Moderate-2; High-3; Extreme-4

6. Accidental Release Measures

Keep the public away. Isolate and evacuate the area. Eliminate all ignition sources. Handling equipment must be grounded or bonded to prevent sparking.

***** Large Spills***** Evacuate the hazard area of unprotected personnel. Wear appropriate respirator and protective clothing. Shut off source of leak only if safe to do so. Dike and contain with sand or soil. If vapor cloud forms, water fog may be used to suppress. Contain run-off. Remove with vacuum trucks or pump to storage/salvage vessels. Soak up residue with an absorbent such as clay, sand or other suitable material; place in non-leaking containers for proper disposal. Flush area with water to remove trace residue and dispose of flush solutions as above.
***** Small Spills***** Take up with an absorbent material and place in non-leaking containers; seal tightly for proper disposal.

7. Handling and Storage

Comply with all regulatory requirements. Store in suitable tanks or closed, labeled containers in a cool, well-ventilated area.

Keep liquid and vapor away from heat, sparks and flame. Surfaces that are sufficiently hot may even ignite liquid product in the absence of sparks or flame. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapors have been dispersed. Containers, even those that have been emptied, can contain explosive vapors. Do not cut, drill, grind, weld or perform similar operations on or near containers. Static electricity may accumulate and create a fire hazard. Ground fixed equipment. Bond and ground transfer containers and equipment.

Wash hands with soap and water before eating, drinking, smoking or using toilet facilities. Launder contaminated clothing before reuse. Dispose of leather articles including shoes which cannot be decontaminated.

8. Exposure Controls/Personal Protection

Occupational Exposure Limits

COMPONENT	OSHA PEL	ACGIH TLV TWA
Crude Oil	400 ppm ***	Not available
Natural Gas	Not available	Not available
Hexane	500 ppm	500 ppm/STEL 1000 ppm
Benzene	1 ppm**/STEL 5 ppm	0.5 ppm

Notes:
** OSHA's action level is 0.5 ppm (29 CFR 1910.1028)
*** Listed PEL was vacated in 1993

Engineering Controls

Maintain air concentrations below flammable limits and occupational exposure standards for chemical components by using ventilation and other engineering controls.

Personal Protective Equipment

Eye/Face Protection
Use safety glasses, chemical splash goggles and/or a face shield as appropriate to prevent eye contact.

Skin Protection
Wear chemical resistant gloves and other protective clothing, as required, to minimize skin contact. Test data from published literature and/or glove and clothing manufacturers indicate suitable protection is provided by neoprene or nitrile gloves.

Respiratory Protection
Use NIOSH approved respiratory protection as required to prevent overexposure to oil mist and vapor. Do not enter storage compartments unless equipped with a NIOSH approved self-contained breathing apparatus with a full face-piece operated in a positive pressure mode.

Protective Clothing
Wear chemical resistant gloves and other protective clothing, as required, to minimize skin contact. Use safety glasses or chemical splash goggles to prevent eye contact. Test data from published literature and/or glove and clothing manufacturers indicate suitable protection is provided by neoprene or nitrile gloves.

9. Physical and Chemical Properties

Appearance and Odor: Black, dark green or yellow liquid; strong hydrocarbon and possible sulfur odor.

pH:	Neutral
Melting Point/freezing point:	Not available
Boiling Point:	<100°F
Flash Point and Method:	<60°F to >200°F / Pensky-Martens Closed Cup Tester
Evaporation Rate:	Slower (N-Butyl Acetate =1)
Flammable Limits:	(approximate % Volume in air) Lower: 1.0 Upper: 7.0
Vapor Pressure:	0-724 mm Hg
Specific Gravity:	0.7-1.0 (H_2O=1.0)
Vapor Density	1.5-3.0 (Air=1)
Solubility:	Slight (in water)
Partition coefficient (n-octanol/water):	2-6
Auto ignition temperature	>500 °F
Decomposition temperature	Not available
Viscosity	Not available

10. Stability and Reactivity

Stability: Stable
Hazardous polymerization: Will not occur
Conditions and Materials to Avoid: Avoid heat, sparks, flame and contact with strong oxidizing agents.
Hazardous Decomposition Products: Thermal decomposition products are highly dependent on the combustion conditions. A complex mixture of airborne, solid, liquid, particulates and gases will evolve when this material undergoes pyrolysis or combustion. Carbon monoxide and other unidentified organic compounds may be formed upon combustion.

11. Toxicological Information

Acute toxicity - Ingestion may cause irritation of the mouth, throat & gastrointestinal tract leading to nausea, vomiting, diarrhea and restlessness. Vapors can be harmful or fatal if inhaled. Exposure may result in central nervous system (CNS) depression. Early to moderate CNS depression may be evidenced by giddiness, headache, dizziness and nausea; in extreme cases, unconsciousness and death may occur.

Skin corrosion/irritation - Based on the presence of light hydrocarbons, crude oil is presumed to be moderately irritating to the skin. Prolonged and repeated contact may cause various skin disorders such as dermatitis, folliculitis, oil acne, or skin tumors.

Eye damage/irritation - Based on the presence of light hydrocarbons, crude oil is presumed to be moderately irritating to the eyes.

Sensitization - Not known to cause respiratory or skin sensitization

Germ cell mutagenicity – Information not available

Carcinogenicity – May contain benzene which is a confirmed human carcinogen (leukemia). Also, several long term skin painting studies in experimental animals have shown crude oil to produce skin cancer.

Reproductive toxicity – Not a known reproductive toxin

Specific Target Organs/Systemic Toxicity – Blood/bone marrow, nervous system, respiratory system, eyes

Aspiration hazard – Aspiration of this product into the lungs can cause chemical pneumonia and can be fatal. Aspiration can occur while vomiting after ingestion of this product. Aspiration pneumonitis may be evidenced by coughing, labored breathing and cyanosis (bluish skin); in severe cases death may occur.

12. Ecological Information

Coating action of oil can kill birds, plankton, algae and fish. Keep out of all bodies of water and sewage drainage systems.

13. Disposal Considerations

This product, as produced, is not specifically listed as an EPA RCRA hazardous waste according to 40 CFR 261. However, when disposed of, it may meet the criteria of a "characteristic" hazardous waste (e.g. D001 – ignitable). This product could also contain benzene and could be considered hazardous because it exhibits the characteristic of "toxicity." It is the responsibility of the user to determine if the material is considered hazardous for disposal under federal, state and local regulations.

14. Transportation Information

Department of Transportation Classification: Flammable liquid if flash point <200°F.
D.O.T. proper shipping name: Crude Oil Petroleum
Other Requirements: UN 1267
Hazard Class: 3
Packing Group II

15. Regulatory Information

TSCA This product is listed on the TSCA chemical inventory.

SARA Section 302 This product does not contain any components on the EPA's extremely hazardous substance list.

SARA Section 304 This product may contain the following component(s) which in the event of a spill may be subject to SARA reporting requirements: toluene, xylene, hexane, benzene.

SARA Section 311/312 The following hazard categories apply to this product:
Acute health hazard
Chronic health hazard
Fire hazard

SARA Section 313 This product may contain the following component(s) which may be subject to reporting on a toxic release inventory: toluene, xylene, hexane, benzene.

EPA-CWA Spills into or leading to surface waters that cause a sheen must be reported to the National Response Center, 800-424-8802.

16. Other Information

Date Prepared:	August 29, 2008
Revised:	October 30, 2013
Last Reviewed:	October 30, 2013

Disclaimer:

The information and recommendations contained in this SDS are believed to be accurate at the date of its preparation. Whiting Oil and Gas Corporation makes no representations or warranties, express or implied, with respect to the accuracy or completeness of the information contained herein. Whiting Oil and Gas Corporation assumes no responsibility for incorrect handling or use of the product or the inherent hazards in the product itself.

MATERIAL SAFETY DATA SHEET

Crude Oil

MSDS Number: HP012
Issue Date: 1/08
Revision: 12-14-12

CHEMICAL PRODUCT AND COMPANY IDENTIFICATION - SECTION 1

Company Identification: Hiland Crude
302 N. Independence, Suite 100
Enid, OK 73702

FOR CHEMICAL EMERGENCY, SPILL LEAK, FIRE, EXPOSURE, OR ACCIDENT:
In the continental U.S., call: Daytime: (580) 242-6040
After Hours: (800) 495-0653
For additional non-emergency information, call: (580) 616-2024

Product Name: Crude Oil
CAS Number: 8002-05-9
Synonym(s): Crude Petroleum
Chemical Formula: Mixture

COMPOSITION/ INFORMATION ON INGREDIENTS - SECTION 2

Chemical Name	OSHA PEL (ppm)	ACGIH TLV (ppm)	Other (ppm)	CAS Number	% By Weight
Petroleum Crude Oil	500 ppm	350 mg/m^3	1100 ppm IDLH	8002-05-9	95 - 100
Benzene	10 ppm	0.5 ppm	2.5 STEL	71-43-2	0 - 2

Note: *These analytical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.*

HEALTH EFFECTS SUMMARY - SECTION 3

The following information summarizes human experience and results of scientific investigations reviewed by health professionals for hazard evaluation of and development of Precautionary Measures and Occupational Control Procedures recommended in this document.

Primary Route of Entry: Dermal contact and ingestion.
Medical Conditions Which Might be Aggravated: Preexisting skin, eye and respiratory disorders may be aggravated by exposure.
Acute Exposure Effects:

1. **Skin:** Prolonged or repeated liquid contact can cause dermatitis, folliculitis or oil acne.
2. **Eyes:** Irritation.
3. **Inhalation:** Irritation
4. **Ingestion:** May be toxic.

EMERGENCY AND FIRST AID PROCEDURES - SECTION 4

Skin: Remove contaminated clothing. Wash with soap and large amounts of water. If irritation develops, obtain medical attention.
Eyes: Flush eyes with water for at least 15 minutes. Get medical attention if irritation persists.
Inhalation: Move to fresh air. Provide artificial respiration if not breathing. Get medical attention if breathing becomes difficult or respiratory irritation persists.
Ingestion: Do not induce vomiting! Do not give liquids! Obtain immediate medical assistance.

FIRE PROTECTION INFORMATION - SECTION 5

Flash Point: 20 - 100° F
Auto ignition Temperature: Not Determined.
Combustibility: Not Determined
Flammable Limits in Air, % by Volume: LEL: Not determined UEL: Not determined
Extinguishing Media: Use dry chemical, foam or carbon dioxide to extinguish flames.
Special Fire Fighting Procedures: Avoid using water streams. Firefighters should wear proper protective equipment and self-contained breathing apparatus.
Unusual Fire and Explosive Hazards: Can be ignited by heat, spark, or flame. Do not expose to heat, sparks, flame, static, or other sources of ignition.

ACCIDENTAL RELEASE MEASURES - SECTION 6

Keep public away. Isolate and evacuate area. Shut off source if safe to do so. Notify appropriate local, state and federal agencies. Protect bodies of water.

HANDLING AND STORAGE PROCEDURES - SECTION 7

Handle as a flammable liquid. Keep away from heat, sparks, flame, and other sources of ignition. Bond and ground containers during product transfer.

OCCUPATIONAL CONTROL PROCEDURES - SECTION 8

Eye Protection: Wear chemical type goggles or face shield.
Skin Protection: Neoprene or nitrile gloves to prevent skin contact.
Respiratory Protection: Not required under normal conditions.
Ventilation: Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits.

PHYSICAL PROPERTIES - SECTION 9

Appearance: Clear colorless liquid
Odor: Similar to Gasoline
Boiling Point: -20° to 600° F (-29° to 316° C)
Vapor Density: 3.4 (Air = 1).
Viscosity: Not Determined
Specific Gravity: .5 to .75 (Water = 1)
Solubility in Water (wt. %): No
Solubility in Other Solvents: Hydrocarbons

Note: *These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.*

PHYSICAL PROPERTIES - SECTION 9

Appearance: Amber, black, brown to greenish black liquid
Odor: Hydrocarbon
Boiling Point: 100° to 1000° F
Vapor Density: 3 to 5 (Air = 1).
Viscosity: Not Determined
Specific Gravity: .7 to .9 (Water = 1)
Solubility in Water (wt. %): No
Solubility in Other Solvents: Not determined

Note: *These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.*

REACTIVITY DATA - SECTION 10

Stability: Stable under normal conditions.
Incompatibility: Strong oxidizers.
Hazardous Decomposition Products: Combustion may produce carbon monoxide, aldehydes, or other hydrocarbons.
Hazardous Polymerization: Polymerization will not occur.

TOXICOLOGY INFORMATION - SECTION 11

Toxicity: Skin – rabbit; >2 ml/kg
Inhalation – No data available
Oral – rat; >5 gm/kg
Teratogenicity: Not established.
Reproductive Toxicity: Not established.
Mutagenicity: Some crude oils have been positive.
Synergistic Products: Not established.
Sensitization to Product: Not established.
Carcinogenicity: Dermal carcinogenicity positive in mice:

NTP	IARC	OSHA
No	No	No

ECOLOGICAL INFORMATION - SECTION 12

Keep out of sewers, drainage and waterways.

DISPOSAL CONSIDERATIONS - SECTION 13

Dispose of container and unused contents in accordance with federal, state and local requirements.

TRANSPORTATION INFORMATION - SECTION 14

DOT
Proper Shipping Name: Petroleum Crude Oil
Hazard Class/I.D. No./Packing Group: 3, UN 1267, I
Label: Flammable liquid

EMERGENCY RESPONSE GUIDEBOOK – Guide 128

REGULATORY INFORMATION - SECTION 15

TSCA Inventory: No

Reportable Quantity (RQ) Under US EPA CERCLA Regulations: Film or sheen upon or discoloration of any water surface.

SARA Hazard Notification Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370): Yes

Section 313 Toxic Chemical(s): Yes - Benzene

Hazardous Chemical(s) Under OSHA Hazard Communication Standard: Yes.

OTHER INFORMATION - SECTION 16

Hazard Ratings:

NFPA	HMIS
Fire – 3	**Health** – 1
Health – 1	**Flammability** – 3
Reactivity – 0	**Reactivity** – 0
Specific Hazard – N/A.	**PPE** – Neoprene or nitrile gloves

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