

**LIMITED SUBSURFACE SAMPLING  
AND TESTING**

Chri-Mar Apartments  
19618-19624 68<sup>th</sup> Avenue West  
Lynnwood, Washington

**MILESTONE PROPERTIES**

# ENVIRONMENTAL ASSOCIATES, INC.

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February 19, 2016

JN-36005

Ms. Rhoda Altom  
Milestone Properties  
P.O. Box 18379  
Seattle, Washington 98118

Subject:       **LIMITED SUBSURFACE SAMPLING & TESTING**  
                  **Chri-Mar Apartments**  
                  **19618-19628 68<sup>th</sup> Avenue West**  
                  **Lynnwood, Washington**

Dear Ms. Altom:

Environmental Associates, Inc. (EAI) has performed limited sampling and testing of subsurface soils, groundwater, and soil-vapor at selected localities on the subject property. The purpose of this work was to make a preliminary assessment of the potential for the presence of chlorinated volatile organic compounds (cVOCs) and petroleum and associated constituent compounds in subsurface materials potentially relating to a former adjacent dry cleaning operation (Slaters 1 Hour Cleaners) and a former gas station, adjacent to the north of the subject. This report, prepared in accordance with the terms of our proposal dated January 21, 2016, summarizes our approach to the project along with results and conclusions.

The contents of this report are confidential and are intended solely for your use and the use of your representatives. Two (2) copies of this report are being distributed to you. No other distribution or discussion of this report will take place without your prior approval in writing.

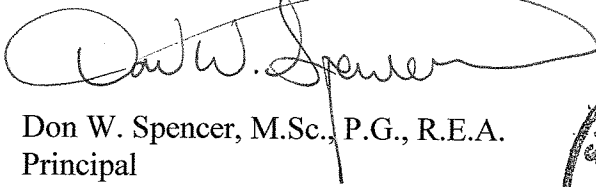


*Milestone Properties*  
*February 19, 2016*

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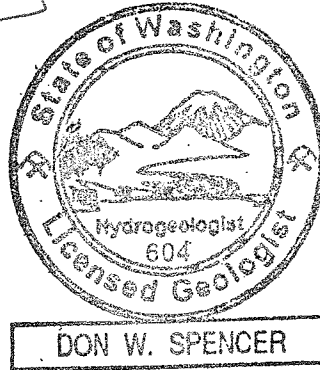
We appreciate the opportunity to be of service on this assignment. If you have any questions or if we may be of additional service, please do not hesitate to contact us.

Respectfully submitted,  
**ENVIRONMENTAL ASSOCIATES, INC.**



Don W. Spencer, M.Sc., P.G., R.E.A.  
Principal

License: 604	(Washington)
License: 11464	(Oregon)
License: 876	(California)
License: 5195	(Illinois)
License: 0327	(Mississippi)



# LIMITED SUBSURFACE SAMPLING AND TESTING

Chri-Mar Apartments  
19618-19628 68<sup>th</sup> Avenue West  
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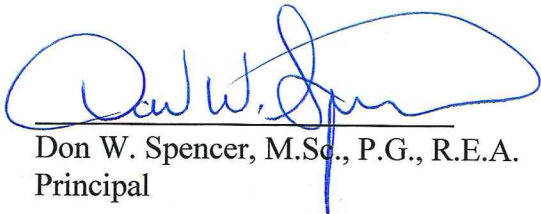
Prepared for:

Milestone Properties  
P.O. Box 18379  
Seattle, Washington 98118

Questions regarding this investigation, the conclusions reached and the recommendations given should be addressed to one of the following undersigned.

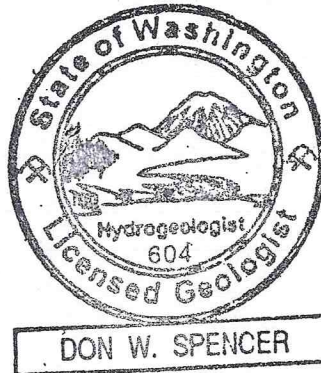


Eric Zuern  
Environmental Geologist / Project Manager



Don W. Spencer, M.Sc., P.G., R.E.A.  
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License: 0327 (Mississippi)



Reference Job Number: JN 36005

February 19, 2016

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## **INTRODUCTION/SCOPE OF WORK**

### **SITE/PROJECT DESCRIPTION**

The subject property is comprised of two (2) rectangular-shaped parcels (tax parcel numbers 27042000201000, 27042000200900) covering approximately 1.41 acres of land. The property is currently occupied by four (4) two-story apartment buildings constructed between 1962 and 1963. The approximate location of the site is shown on the Vicinity/Topographic Map, Plate 1, appended herewith.

### **Background**

Milestone Properties presented EAI with a report summarizing the findings of a Phase I Environmental Site Assessment for the subject prepared by Cardno ATC (Cardno) for the subject site dated March 22, 2015. That report identified a former lube shop/gas station adjacent to the northeast portion of the property (currently a café) which has reported releases of petroleum products and associated constituents to the Washington Department of Ecology (WDOE) in the past as well as a north adjacent dry cleaning operation which reportedly utilized perchloroethene (PCE/PERC). Those two off-site operations were considered “recognized environmental conditions” (RECs) associated with the subject property. Cardno recommended subsurface investigation of the subject to characterize potential impacts from those off-site facilities.

While not noted directly as a concern to the site, EAI’s review of materials presented in Cardno’s report revealed another off-site gas station historically located across 68<sup>th</sup> Avenue West, northeast of the subject site in an inferred up-gradient hydrologic position.

Between the publication date of the Phase I report (March 22, 2015) and EAI’s proposal date (January 21, 2016), the adjacent northern dry cleaner appears to have vacated its tenant space however signage and the empty unit revealed its location.

### **Current Study**

Your expressed interests to conduct a preliminary evaluation of subsurface conditions to assess the potential for the presence of petroleum and volatile organic compounds as memorialized in EAI’s proposal dated January 21, 2016, formed the basis for the following scope of work:

- Drilled and sampled five (5) borings along the northern accessible portions of the property. Soil and groundwater samples were obtained from each boring and a log of subsurface conditions encountered was prepared for each boring by the EAI project geologist. Soil-vapor was collected at two of the boring locations at shallow depths below the asphalt surface. Prior to drilling, a Health & Safety Plan was reviewed and signed by the on-site driller and project manager.

- Laboratory analysis of selected soil, groundwater, or soil-vapor samples for volatile organic compounds and petroleum products typical of dry cleaning operations and gas stations.
- Preparation of this summary report documenting the methodology and results of the investigation.

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## **FINDINGS**

### **SUBSURFACE INVESTIGATION**

#### **Soil Boring Sampling**

Five (5) soil borings were made on February 4, 2016 at the approximate locations identified as B-1, B-2, B-3, B-4, and B-5 on the attached Site Plan, Plate 2. The logs appear as Plates 3 through 7 in the back of this report. Borings B-1 and B-2 were placed along the western half of the northern property line near to or directly behind the former off-site dry cleaning business. Boring B-3 was placed along a northern gated area between the off-site dry cleaner and gas station. Due to limited access and caution regarding water lines potentially extending along the narrow exterior access along the northeastern on-site building addressed at 19618 68<sup>th</sup> Ave. West, borings B-4 and B-5 were installed south of building 19618, generally south/downgradient, south of the historic north adjacent gas station. The borings were extended to a depths between 10 to 17.5 feet below ground surface (bgs). Groundwater was not initially encountered in borings B-1 and B-2, thus both borings were left open for a period of time to allow for groundwater to gradually infiltrate as controlled by local permeability and available head. Groundwater was found in B-3 and B-5 between 4 to 5 feet bgs. Groundwater at B-4 was encountered at approximately 9.5 feet.

#### **Soil and Groundwater Sampling Procedure**

Under the observation of the EAI field geologist, a truck mounted push-robe drill rig was brought into position over each selected boring location. Following set-up preparations, the push-probe boring/sampling technique consisted of advancing a five (5) foot length plastic lined sampler into the ground. The sampler was then withdrawn and the liner was removed and cut open for examination and transfer of the soil sample to laboratory prepared glassware. Soil samples were collected by EPA Method 5035A.

After soil sampling within the borings had been completed and as groundwater was observed in the borings, a temporary well screen was installed in an attempt to sample the groundwater. Small plastic tubing was extended from a peristaltic pump into each well to recover groundwater samples.

Soil and groundwater samples were transferred from the sampler directly to sterilized laboratory prepared glassware which were then stored in an iced chest maintained at approximately 4 degrees centigrade at the site and taken to the laboratory in this condition in an effort to preserve sample integrity.

Each sample container was clearly labeled as to boring and sample number/depth, date, time, project, etc. EPA-recommended sample-management protocol was observed at each stage of the project. During drilling, a field log was made by EAI for each boring. Information recorded versus corresponding depth included soil classification (Unified Soil Classification System), color, texture, relative moisture, odors (if present), etc.

### **Soil-Vapor Sampling Procedure**

Upon reaching the allowable depths of between 2 to 5 feet bgs at localities B-1 and B-3, soil vapor samples were collected through a temporary screen and casing rod inserted into the ground by the drill rig. Hydrated bentonite clay was used to seal the annulus of the bore hole around the upper casing rod to inhibit dilution from of atmospheric air in the soil vapor sample. A laboratory-prepared "summa canister" (vacuum cylinder) was then utilized to collect a sample of the subsurface soil-vapor at the specified locations. Utilizing flow controllers and gauge-vacuum provided by Eurofins Air Toxics of California, soil-vapor was collected over a span of thirty minutes to over an hour.

Each sample container was clearly labeled as to sample number/location, date, time, project, etc. EPA-recommended sample-management protocol was observed at each stage of the project.

### **Subsurface Conditions**

Generally interpreted as glacial till, soils encountered within the borings generally consisted of a mixture of sand, silts, and gravels with the subsurface matrix becoming denser with increasing depth. As mentioned previously, potentially owing to low permeability, groundwater was not initially encountered in borings B-1 and B-2. Both of these were left open for a period of time to allow for groundwater to gradually infiltrate the borings. Groundwater was found in B-3 and B-5 between 4 to 5 feet bgs. Groundwater at B-4 was encountered at approximately 9.5 feet.

### **LABORATORY ANALYSIS**

Laboratory analysis of soil and groundwater samples was conducted by Environmental Service Network (ESN), Olympia, Washington, a WDOE-accredited analytical laboratory. Select soil and groundwater samples were submitted for analysis of chlorinated volatile organic compounds (VOCs) gasoline, diesel, and heavy oil range petroleum hydrocarbons as well as benzene, toluene, ethylbenzene, and xylenes (BTEX). Laboratory analysis of soil-vapor samples was conducted by Eurofins Air Toxics of California. Laboratory analysis was performed on each soil vapor sample for VOCs by EPA Method TO-15



As summarized in Table 1 attached to this report, select soils sampled from each boring contained no detectable concentrations of petroleum products or BTEX (benzene, toluene, ethylbenzene, xylenes) compounds.

As depicted in Table 2 appended to this report, groundwater from each boring also contained no detectable concentrations of petroleum products or BTEX (benzene, toluene, ethylbenzene, xylenes) compounds.

As summarized in Table 3, attached to this report, soil sampled from B-2 at a depth of 15 feet bgs contained concentrations of perchloroethene (PCE/PERC) at 0.095 parts per million (ppm) which is above the MTCA Method-A compliance limit of 0.05 ppm. Soil sampled from B-3 at a depth of 5 feet bgs contained PCE at a concentration of 0.031, below (i.e. compliant with) the MTCA Method-A cleanup level while soil sampled at a greater depth at that locality (B-3) at 15 feet bgs contained PCE at 0.10 ppm, above its compliance limit.

As shown in Table 4 appended to this report, Groundwater sampled from B-2 contained PCE at a concentration of 14 parts per billion (ppb) while groundwater sampled from B-3 detected PCE at 35 ppb. Those concentrations are above the MTCA Method-A compliance limit for that analyte in groundwater, currently established at 5 ppb. Trichloroethene (TCE), a degradation product of PCE, was detected in groundwater from B-3 at 5.3 ppb, slightly above the established Method-A cleanup limit for that analyte (currently established at 5 ppb). Finally, (cis) 1,2 Dichloroethene, another degradation product of PCE was found at 1 ppb in B-3, well below (i.e. compliant with) its current Method-B cleanup limit (16 ppb).

As shown in Table 5 appended to this report, results of soil-vapor testing from borings B-1 and B-3 revealed detections of benzene at 48 and 59 ug/m<sup>3</sup> respectively as well as 1,3-butadiene at 59, and 160 ug/m<sup>3</sup> respectively which are above the MTCA Method B screening levels for those analytes listed in the 2015-dated guidance table document published by the Washington Department of Ecology. Additionally, PCE and TCE were detected in soil-vapor at B-3 at 38 and 20 ug/m<sup>3</sup> respectively. While that PCE concentration is below its applicable MTCA Method-B screening level, the concentration of TCE is above its applicable screening limit. Other detections of various analytes encountered which do not have established soil vapor screening levels or were compliant with published levels within the samples are depicted in the attached laboratory data.

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## CONCLUSIONS

Relying upon the results of limited soil, groundwater, and soil-vapor sampling and laboratory testing documented in this preliminary effort, PCE was found above its applicable MTCA Method-A cleanup level in soils and groundwater at boring locations B-2 and B-3. TCE was also encountered in groundwater at B-3 above its applicable MTCA Method-A cleanup limit. Finally, benzene, 1,3-butadiene, and TCE were observed in various soil-vapor samples at concentrations above their applicable MTCA

PCE and its associated degradation product TCE are typically utilized as dry cleaning solvents. Acknowledging that work performed by others confirmed the use of PCE at the former adjacent dry cleaning facility and that locations B-2 and B-3 are located directly behind or near the former cleaner, it would be reasonable to infer that on-site impacts by chlorinated solvents may have originated at the former adjacent dry cleaning operation.

Additionally, acknowledging the documented historic petroleum release at the north-adjacent former gas station, the detection of benzene in soil-vapor appears to likely relate to that documented release. Detections in soil-vapor for 1,3-butadiene are generally related to wood or diesel fuel combustion and that analyte is monitored by the Puget Sound Clean Air Agency as a background low-level contaminant in the Puget Sound region. Detections of 1,3-butadiene found in on-site soil-vapor were present at concentrations generally higher than listed background levels. The exact source of the 1,3-butadiene detections remains unknown at this time.

### Recommendations

While the detections of chlorinated solvents in soils and groundwater adjacent to the northern property line indicate an off-site source, the horizontal and vertical extent of on-site impacts currently remain undefined. Such definition was not envisioned as part of this initial limited scope sampling and testing work. If further delineation of the on-site impacts is desired by the client and/or other involved parties, additional soil and groundwater sampling should be performed to evaluate the extent of chlorinated solvent impacts.

Acknowledging that certain provisions of Washington law (RCW 70.105D.020, par. (12), sec. (iii), et seq, often referenced as the “plume clause” provide exemption from liability to a property owner for cleanup costs relating to water-borne contaminants migrating onto a site from off-site source(s), the noted clause does little to mitigate such problems as potential risks to public health or the environment, nor does it ameliorate potential “impacts” to property valuation on a comparative basis to similar properties not affected by such environmental issues. Recognizing the potential complexities which often attend situations such as this, the following actions may provide a useful framework potentially leading (at some point) toward productive resolutions:

- At such time as on-site impacts are characterized to the extent practicable, property ownership may wish to consider formal disclosure of these findings to owners/operators of the north-adjacent site(s) so that they may be apprised of this discovery in a timely manner. Such communication(s) may benefit substantially from use of appropriate legal counsel familiar with adjudication of environmental liability matters.
- Provisions of the Model Toxics Control Act (MTCA), Chapter 173-340 -300 require “any owner or operator” who has information that a hazardous substance has been released to the environment ..... and may be a threat to human health or the environment” shall report such information to the department (WDOE) within ninety (90) days of discovery.
- As the north-adjacent former gas station property appears to have some reporting history relating to releases, transmittal of new information as discussed in the current report may be useful to WDOE so as to enable them to fulfill their obligations as to protection of health and environment.
- With respect to the recently ceased north-adjacent dry cleaner operation, as no listings suggestive of releases for that operation were discovered in the databases reviewed, disclosure of the current findings to WDOE would potentially represent the first notice that operator might receive with respect to the discovery of dry cleaning solvent (perchloroethylene/PCE) in the subsurface environment.

Finally, in an effort to determine whether soil-vapor impacts may potentially affect on-site residential tenants, indoor and outdoor air sampling should be conducted to assess whether soil-vapors are (or are not) migrating through building foundations and potentially accumulating in occupied areas. Outdoor samples would be collected and tested in an effort to compare outdoor “ambient” conditions relative to indoor measurements.

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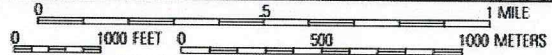
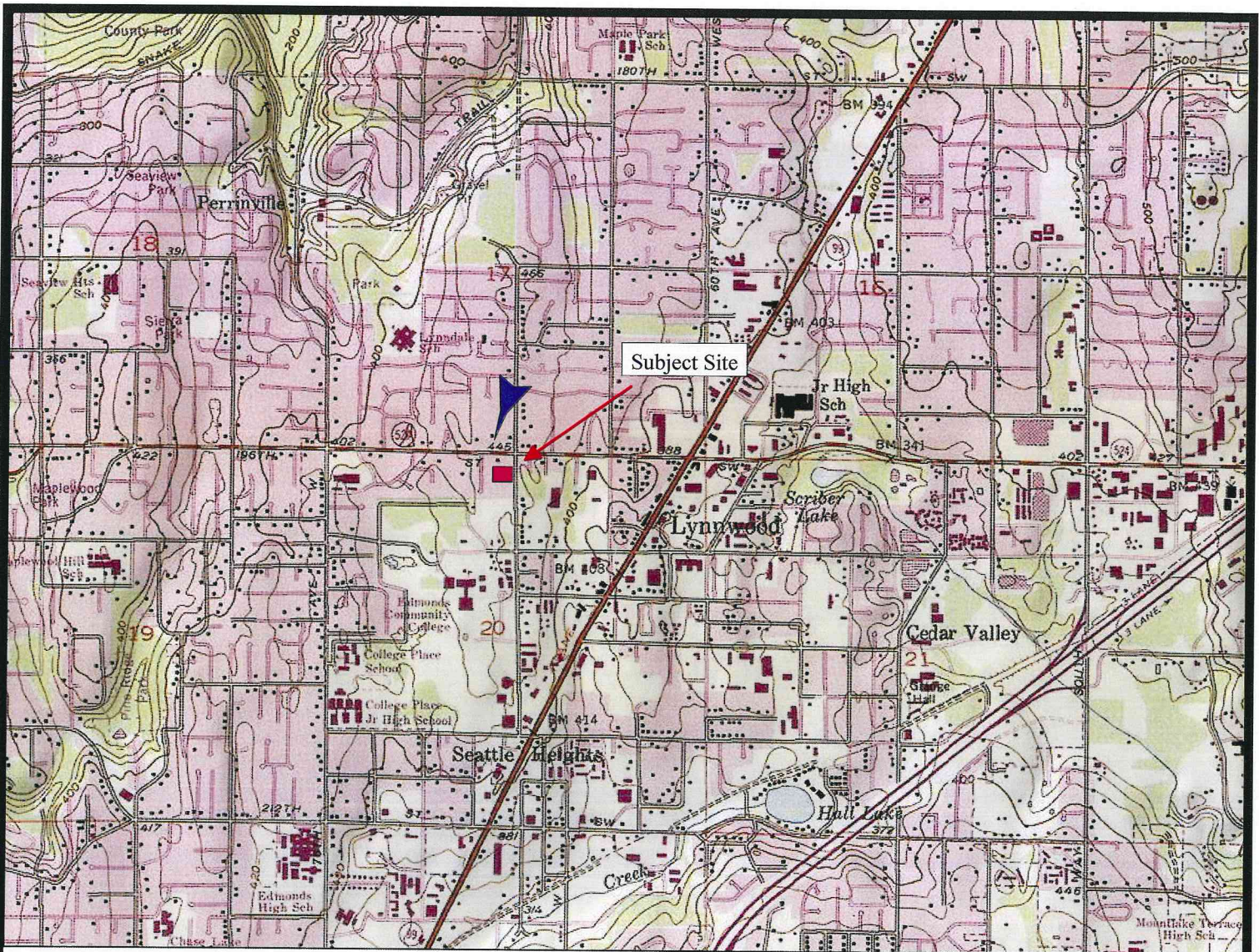
## **LIMITATIONS**

This report has been prepared for the exclusive use of Milestone Properties along with Chase Bank (Lender) and their several representatives for specific application to this site. Our work for this project was conducted in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area, and in accordance with the terms and conditions set forth in our proposal dated January 21, 2016. The findings and conclusions of this study are based upon the results of laboratory testing of selected samples obtained from separated boring localities and conditions may vary between those locations or at other locations, media, depths, or date. No other warranty, expressed or implied, is made. If new information is developed in future site work which may include excavations, borings, studies, etc., Environmental Associates, Inc., must be retained to reevaluate the conclusions of this report and to provide amendments as required.

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## **REFERENCES**

Cardno ATC, March 22, 2015, Phase I Environmental Site Assessment, 19618-19624 68<sup>th</sup> Avenue West, Lynnwood, Washington.



Map created with TOPO!® ©2003 National Geographic (www.nationalgeographic.com/topo)

 **Site Location**

 **Inferred Approximate Direction of Groundwater Flow at Subject**



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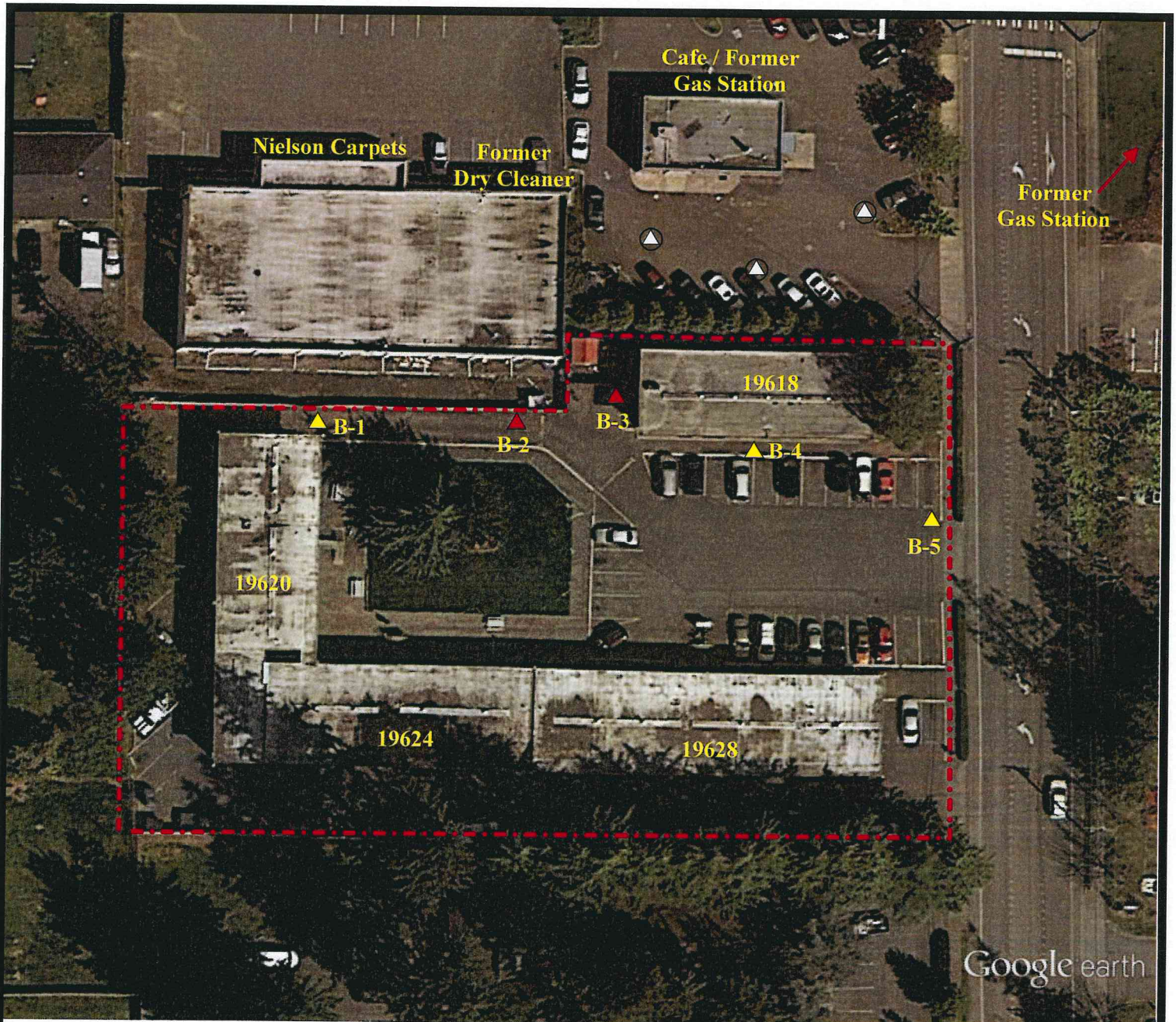
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**VICINITY/TOPOGRAPHIC MAP**

**Chri-Mar Apartments  
19618-19628 68th Avenue West  
Lynnwood, Washington**

<b>Job Number:</b> JN 36005	<b>Date:</b> February 2016	<b>Plate:</b> 1
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Approximate Monitoring Well Locations



Approximate Boring Locations (yellow=compliant, red=non-compliant)



Approximate Site Boundary



Inferred Approximate Direction of Groundwater Flow at Subject



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**SITE PLAN**

Chri-Mar Apartments  
19618-19628 68th Avenue West  
Lynnwood, Washington

Job Number:

JN 36005

Date:

February 2016

Plate:

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# BORING B1

Depth/ Sample	Well Design	Moisture/ Water Table	Blows / Foot	USCS	DESCRIPTION
0	None	Dry		GM	Brown silt and gravels, dry, no odors or discoloration, PID=0
5					
10		Moist		SP	Brown/grey sand and cobbles, moist, no odors or discoloration, PID=0
15		Moist		GM	Grey compact silt and gravels, moist, no odors or discoloration, PID=0.3
17.5		Dry		SM	Grey silt, sand, and gravels, dry, no odors or discoloration, PID=0.2
20	Boring refusal at 17.5 feet below grade on February 4, 2016.				
25					
30					
35					
40					

Hammer Weight: N/A  
Driller: Environmental Services Network, Inc.



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## Boring: B1

Chri-Mar Apartments  
19618-19628 68th Avenue West  
Lynnwood, Washington

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# BORING B2

Depth/ Sample	Well Design	Moisture/ Water Table	Blows / Foot	USCS	DESCRIPTION
0	None	Dry		SM	Brown silt, sand, and gravels, dry, no odors or discoloration, PID=0.2
5					
10					
15		Dry		SM	Grey/brown dense sand, silt, and gravels, dry, no odors or discoloration, PID=0.3
20	Boring terminated at 15 feet below grade on February4, 2016.				
25					
30					
35					
40					

Hammer Weight: N/A  
Driller: Environmental Services Network, Inc.



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## Boring: B2

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Lynnwood, Washington

Job Number:

JN 36005

Date:

February 2016

Logged by:

EAZ

Plate:

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# BORING B3

Depth/ Sample	Well Design	Moisture/ Water Table	Blows / Foot	USCS	DESCRIPTION
0					
5	None	Wet		GM	Brown silt and gravels, wet, no odors or discoloration, PID=0.3
10		Moist		SM	Brown sand, silt, and gravels, moist, no odors or discoloration, PID=0.2
15		Moist		SM	Brown sand, silt, and gravels, moist, no odors or discoloration, PID=0.5
Boring terminated at 15 feet below grade on February 4, 2016.					
20					
25					
30					
35					
40					

Hammer Weight: N/A  
Driller: Environmental Services Network, Inc.



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## Boring: B3

Chri-Mar Apartments  
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Lynnwood, Washington

Job Number:

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Date:

February 2016

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Plate:

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# BORING B4

Depth/ Sample	Well Design	Moisture/ Water Table	Blows / Foot	USCS	DESCRIPTION
0					
5	None	Dry		SM	Dark brown silt, sand, and gravels, dry, no odors or discoloration, PID=0.5
10		Moist		SW	Grey sands and gravels, moist, no odors or discoloration, PID=0.3
15		Wet		SM	Brown sand, silt, and gravels, wet, no odors or discoloration, PID=0.3
Boring terminated at 15 feet below grade on February 4, 2016.					
20					
25					
30					
35					
40					

Hammer Weight: N/A  
Driller: Environmental Services Network, Inc.



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## Boring: B4

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Lynnwood, Washington

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# BORING B5

Depth/ Sample	Well Design	Moisture/ Water Table	Blows / Foot	USCS	DESCRIPTION
0					
5	None	Moist		ML	Brown silt (fill), moists, no odors or discoloration, PID=0.3
10		Dry		SM	Grey silt, sands, and gravels, wet, no odors or discoloration, PID=0.3
Boring terminated at 10 feet below grade on February4, 2016.					
15					
20					
25					
30					
35					
40					

Hammer Weight: N/A  
Driller: Environmental Services Network, Inc.



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## Boring: B5

Chri-Mar Apartments  
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Date:

February 2016

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Plate:

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**TABLE 1 - Petroleum Hydrocarbons and BTEX - Soil Sampling Results**  
**All results and limits in parts per million (ppm)**

Strataprobe Boring	Gasoline (TPH)	Diesel	Heavy Oil	Benzene	Toluene	Ethylbenzene	Total Xylenes
B1-15 @ 15'	ND	ND	ND	ND	ND	ND	ND
B1-15 @ 15' DUPLICATE	NA	ND	ND	NA	NA	NA	NA
B2-15 @ 15'	ND	ND	ND	ND	ND	ND	ND
B2-15 @ 15' DUPLICATE	ND	NA	NA	ND	ND	ND	ND
B3-5 @ 5'	ND	ND	ND	ND	ND	ND	ND
B4-10 @ 10'	ND	ND	ND	ND	ND	ND	ND
B5-10 @ 10'	ND	ND	ND	ND	ND	ND	ND
Reporting Limit <sup>3</sup>	10	50	100	0.02	0.05	0.05	0.15
<b>WDOE Target Compliance Level<sup>4</sup></b>	<b>30 or 100<sup>5</sup></b>	<b>2000</b>	<b>2000</b>	<b>0.03</b>	<b>7</b>	<b>6</b>	<b>9</b>

## Notes:

- 1 - "ND" denotes analyte not detected at or above listed Reporting Limit.
- 2 - "NA" denotes sample not analyzed for specific analyte.
- 3 - "Reporting Limit" represents the laboratory lower quantitation limit.
- 4 - Soil samples were field screened using a GasTech combustible gas meter to measure the concentration of combustible gas, such as petroleum VOCs. Headspace VOC concentrations were measured after placing the soil sample in a sealed plastic bag and allowing soil and air inside the bag to equilibrate.
- 5 - The MTCA gasoline TPH cleanup level is 30 ppm for soils with benzene otherwise it is 100 ppm.

Bold and Italics denotes concentrations above MTCA Method A soil cleanup levels.

BGS - Below ground surface.

**TABLE 2- Petroleum Hydrocarbons and BTEX- Groundwater Sampling Results**  
**All results and limits in parts per billion (ppb)**

Strataprobe Boring	Gasoline (TPH)	Diesel (TPH)	Heavy Oil (TPH)	Benzene	Toluene	Ethylbenzene	Total Xylenes
B1-Water	ND	ND	ND	ND	ND	ND	ND
B2-Water	ND	ND	ND	ND	ND	ND	ND
B3-Water	ND	ND	ND	ND	ND	ND	ND
B4-Water	ND	ND	ND	ND	ND	ND	ND
B5-Water	ND	ND	ND	ND	ND	ND	ND
Reporting Limit <sup>3</sup>	100	250	500	1	1	1	3
<b>MTCA-Method-A Cleanup Levels<sup>4</sup></b>	<b>800 or 1000<sup>5</sup></b>	<b>500</b>	<b>500</b>	<b>5</b>	<b>1000</b>	<b>700</b>	<b>1000</b>

## Notes:

- 1 - "ND" denotes analyte not detected at or above listed Reporting Limit.
- 2 - "NA" denotes sample not analyzed for specific analyte.
- 3- "Reporting Limit" represents the laboratory lower quantitation limit.
- 4- Method A groundwater cleanup levels as published in the Model Toxics Control Act (MTCA) 173-340-WAC.
- 5- The MTCA gasoline TPH cleanup level is 800 ppb for groundwater with benzene. Otherwise, the cleanup level is 1000 ppb.

Bold and Italics denotes concentrations above existing or proposed MTCA Method A groundwater cleanup levels.

**TABLE 3- VOCs - Soil Sampling Results**  
**All results and limits in parts per million (ppm)**

Strataprobe Boring	Tetrachloroethene (PCE)	Trichloroethene (TCE)	(cis) 1,2 Dichloroethene	(trans) 1,2 Dichloroethene	Vinyl Chloride
B1-15 @ 15'	ND	ND	ND	ND	ND
B2-15 @ 15'	<b>0.095</b>	ND	ND	ND	ND
B3-5 @ 5'	0.031	ND	ND	ND	ND
B3-15 @ 15'	<b>0.10</b>	ND	ND	ND	ND
B4-10 @ 10'	ND	ND	ND	ND	ND
Reporting Limit <sup>3</sup>	0.02	0.02	0.05	0.05	0.02
Cleanup Level for Unrestricted Land Use (Method-A) <sup>4</sup>	0.05	0.03	---	---	---
Cleanup Level - (Method-B) <sup>5</sup>	476	12	160	1600.0	0.667

Notes:

- 1 - "ND" denotes analyte not detected at or above listed Reporting Limit.
- 2 - "NA" denotes sample not analyzed for specific analyte.
- 3 - "Reporting Limit" represents the laboratory lower quantitation limit.
- 4 - Method A soil cleanup levels for unrestricted land use as published in the Model Toxics Control Act (MTCA) 173-340-WAC, Table 740-1.
- 5 - Method-B soil cleanup levels for the "direct contact pathway", as published in Ecology's CLARC May 2014 database.

Bold and Italics denotes concentrations above existing MTCA Method A or B soil cleanup levels.

<b>TABLE 4- VOCs - Groundwater Sampling Results</b> <b>All results and limits in parts per billion (ppb)</b>					
<b>Boring</b>	<b>Tetrachloroethene (PCE)</b>	<b>Trichloroethene (TCE)</b>	<b>(cis) 1,2 Dichloroethene</b>	<b>(trans) 1,2 Dichloroethene</b>	<b>Vinyl Chloride</b>
B1-Water	ND	ND	ND	ND	ND
B2-Water	<b><i>14</i></b>	ND	ND	ND	ND
B3-Water	<b><i>35</i></b>	<b><i>5.3</i></b>	1	ND	ND
B4-Water	ND	ND	ND	ND	ND
B5-Water	ND	ND	ND	ND	ND
Reporting Limit <sup>3</sup>	1	1	1	1	0.2
Existing Cleanup Level <sup>4</sup>	5 (A)	5 (A)	16 (B)	160 (B)	0.2 (A)

Notes:  
 1 - "ND" denotes analyte not detected at or above listed Reporting Limit.  
 2- "NA" denotes sample not analyzed for specific analyte.  
 3- "Reporting Limit" represents the laboratory lower quantitation limit.  
 4- Method A or B groundwater cleanup levels as published in the Model Toxics Control Act (MTCA) 173-340-WAC, amended May 2014.

Bold and Italics denotes concentrations above existing MTCA Method A groundwater cleanup levels.

**TABLE 5 - Select VOCs - Soil Vapor Sampling Results**  
**All results and limits in micro-grams per cubic meter (ug/M<sup>3</sup>)**

Sample Name	Location & Depth	Tetrachloroethene (PCE)	Trichloroethene (TCE)	1,1,1 Trichloroethane	1,1 Dichloroethene	Vinyl Chloride	Benzene	1,3-Butadiene
B-1	B-1 @ 5 feet	ND	ND	ND	ND	ND	48	59
B-3	B-3 @ 2.5 feet	38	20	ND	ND	ND	59	160
WDOE - Soil Gas Screening Levels <sup>4</sup>		321	12.3	76,200	3,050	9.33	10.7	2.78

Notes:

- 1 - "ND" denotes analyte not detected at or above listed Reporting Limit.
- 2 - "NA" Not applicable.
- 3 - "Reporting Limit" represents the laboratory lower quantitation limit.
- 4 - Soil gas screening level that concentrations in the soil gas just beneath a building expected to not result in exceedance of the air cleanup level in the overlying structure, per the WDOE's Guidance For Evaluating Soil Vapor Intrusion - (April, 2015).

***Bold and Italics*** indicate concentrations of soil vapor that exceed the WDOE soil gas screening level and/or concentrations that exceed the WDOE Standard Method-B Air Target Compliance Levels.



## **APPENDIX A**

Lab Reports





**ESN NORTHWEST CHEMISTRY LABORATORY**

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**Analysis of Diesel Range Organics & Lube Oil Range Organics in Soil  
by Method NWTPH-Dx Extended**

Sample Number	Date Prepared	Date Analyzed	Surrogate Recovery (%)	Diesel Range Organics (mg/kg)	Lube Oil Range Organics (mg/kg)
Method Blank	2/10/2016	2/10/2016	105	nd	nd
LCS	2/10/2016	2/10/2016	89	91%	---
B1-15	2/10/2016	2/10/2016	110	nd	nd
B1-15 Duplicate	2/10/2016	2/10/2016	87	nd	nd
B2-15	2/10/2016	2/10/2016	116	nd	nd
B3-5	2/10/2016	2/10/2016	122	nd	nd
B4-10	2/10/2016	2/10/2016	130	nd	nd
B5-10	2/10/2016	2/10/2016	91	nd	nd
Reporting Limits				50	100

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 50% TO 150%

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**Analysis of Diesel Range Organics & Lube Oil Range Organics in Water  
by Method NWTPH-Dx Extended**

Sample Number	Date Prepared	Date Analyzed	Surrogate Recovery (%)	Diesel Range Organics (ug/L)	Lube Oil Range Organics (ug/L)
Method Blank	2/8/2016	2/8/2016	147	nd	nd
LCS	2/8/2016	2/8/2016	113	110%	---
B1-Water	2/8/2016	2/8/2016	108	nd	nd
B2-Water	2/8/2016	2/8/2016	108	nd	nd
B3-Water	2/8/2016	2/8/2016	113	nd	nd
B4-Water	2/8/2016	2/8/2016	109	nd	nd
B5-Water	2/8/2016	2/8/2016	113	nd	nd
Reporting Limits				250	500

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE : 50% TO 150%

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**Analysis of Gasoline Range Organics & BTEX in Soil by Method NWTTPH-Gx/8260**

Sample Number	Date Prepared	Date Analyzed	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	Gasoline Range Organics (mg/kg)	Surrogate Recovery (%)
Method Blank	2/8/2016	2/8/2016	nd	nd	nd	nd	nd	114
LCS	2/8/2016	2/8/2016	120%	115%	126%	118%	110%	110
LCSD	2/8/2016	2/8/2016	100%	100%	100%	97%	---	109
B1-15	2/4/2016	2/8/2016	nd	nd	nd	nd	nd	114
B2-15	2/4/2016	2/9/2016	nd	nd	nd	nd	nd	110
B2-15 Duplicate	2/4/2016	2/9/2016	nd	nd	nd	nd	nd	114
B3-5	2/4/2016	2/9/2016	nd	nd	nd	nd	nd	114
B4-10	2/4/2016	2/9/2016	nd	nd	nd	nd	nd	107
B5-10	2/4/2016	2/9/2016	nd	nd	nd	nd	nd	113
Reporting Limits			0.02	0.05	0.05	0.15	10	

"---" Indicates not tested for component.

"nd" Indicates not detected at the listed detection limits.

"Int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Bromofluorbenzene) & LCS : 65% TO 135%

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**Analysis of Gasoline Range Organics & BTEX in Water by Method NWTPH-Gx/8260**

Sample Number	Date Analyzed	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Gasoline Range Organics (ug/L)	Surrogate Recovery (%)
Method Blank	2/10/2016	nd	nd	nd	nd	nd	99
LCS	2/10/2016	70%	69%	75%	76%	69%	97
LCSD	2/10/2016	81%	85%	91%	92%	---	95
B1-Water	2/10/2016	nd	nd	nd	nd	nd	93
B2-Water	2/10/2016	nd	nd	nd	nd	nd	96
B3-Water	2/10/2016	nd	nd	nd	nd	nd	96
B4-Water	2/10/2016	nd	nd	nd	nd	nd	93
B5-Water	2/10/2016	nd	nd	nd	nd	nd	93
Trip Blank	2/10/2016	nd	nd	nd	nd	nd	94
Reporting Limits		1.0	1.0	1.0	3.0	100	

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Bromofluorobenzene) & LCS: 65% TO 135%

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## Analysis of Chlorinated Volatile Organic Compounds in Soil by Method 8260C/5035

	RL	MB	LCS	LCSD	B1-15	B2-15	B3-5	B4-10
Date extracted		02/08/16	02/08/16	02/08/16	02/04/16	02/04/16	02/04/16	02/04/16
Date analyzed	(mg/Kg)	02/08/16	02/08/16	02/08/16	02/08/16	02/09/16	02/09/16	02/09/16
% Moisture					9%	16%	12%	10%
Dichlorodifluoromethane	0.05	nd			nd	nd	nd	nd
Chloromethane	0.05	nd			nd	nd	nd	nd
Vinyl chloride	0.02	nd	105%	103%	nd	nd	nd	nd
Chloroethane	0.05	nd			nd	nd	nd	nd
Trichlorofluoromethane	0.05	nd			nd	nd	nd	nd
1,1-Dichloroethene	0.05	nd	77%	82%	nd	nd	nd	nd
Methylene chloride	0.05	nd			nd	nd	nd	nd
trans-1,2-Dichloroethene	0.05	nd			nd	nd	nd	nd
1,1-Dichloroethane	0.05	nd			nd	nd	nd	nd
cis-1,2-Dichloroethene	0.05	nd			nd	nd	nd	nd
2,2-Dichloropropane	0.05	nd			nd	nd	nd	nd
Chloroform	0.05	nd	119%	117%	nd	nd	nd	nd
Bromochloromethane	0.05	nd			nd	nd	nd	nd
1,1,1-Trichloroethane	0.05	nd			nd	nd	nd	nd
1,2-Dichloroethane (EDC)	0.05	nd			nd	nd	nd	nd
1,1-Dichloropropene	0.05	nd			nd	nd	nd	nd
Carbon tetrachloride	0.05	nd			nd	nd	nd	nd
Trichloroethene (TCE)	0.02	nd	111%	117%	nd	nd	nd	nd
1,2-Dichloropropane	0.05	nd	123%	124%	nd	nd	nd	nd
Bromodichloromethane	0.05	nd			nd	nd	nd	nd
cis-1,3-Dichloropropene	0.05	nd			nd	nd	nd	nd
trans-1,3-Dichloropropene	0.05	nd			nd	nd	nd	nd
1,1,2-Trichloroethane	0.05	nd			nd	nd	nd	nd
1,3-Dichloropropane	0.05	nd			nd	nd	nd	nd
Dibromochloromethane	0.05	nd			nd	nd	nd	nd
Tetrachloroethene (PCE)	0.02	nd	92%	96%	nd	0.095	0.031	nd
Chlorobenzene	0.05	nd	96%	99%	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.05	nd			nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	0.05	nd			nd	nd	nd	nd
1,2,3-Trichloropropane	0.05	nd			nd	nd	nd	nd
2-Chlorotoluene	0.05	nd			nd	nd	nd	nd
4-Chlorotoluene	0.05	nd			nd	nd	nd	nd
1,3-Dichlorobenzene	0.05	nd			nd	nd	nd	nd
1,4-Dichlorobenzene	0.05	nd			nd	nd	nd	nd
1,2-Dichlorobenzene	0.05	nd			nd	nd	nd	nd
1,2-Dibromo-3-Chloropropane	0.05	nd			nd	nd	nd	nd
1,2,4-Trichlorobenzene	0.05	nd			nd	nd	nd	nd
Hexachloro-1,3-butadiene	0.05	nd			nd	nd	nd	nd
1,2,3-Trichlorobenzene	0.05	nd			nd	nd	nd	nd
Surrogate recoveries								
Dibromofluoromethane		104%	107%	101%	104%	106%	107%	105%
Toluene-d8		97%	90%	89%	92%	97%	100%	96%
4-Bromofluorobenzene		114%	110%	109%	114%	110%	114%	107%

### Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits  
 Acceptable Recovery limits: 65% TO 135%  
 Acceptable RPD limit: 35%



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## Analysis of Chlorinated Volatile Organic Compounds in Water by Method 8260C/5030C

### Analytical Results

Date analyzed	RL (ug/L)	MB 02/10/16	LCS 02/10/16	LCSD 02/10/16	B1-Water 02/10/16	B2-Water 02/10/16	B3-Water 02/10/16	B4-Water 02/10/16
Dichlorodifluoromethane	1.0	nd			nd	nd	nd	nd
Chloromethane	1.0	nd			nd	nd	nd	nd
Vinyl chloride	0.2	nd	89%	115%	nd	nd	nd	nd
Chloroethane	1.0	nd			nd	nd	nd	nd
Trichlorofluoromethane	1.0	nd			nd	nd	nd	nd
1,1-Dichloroethene	1.0	nd	84%	105%	nd	nd	nd	nd
Methylene chloride	1.0	nd			nd	nd	nd	nd
trans-1,2-Dichloroethene	1.0	nd			nd	nd	nd	nd
1,1-Dichloroethane	1.0	nd			nd	nd	nd	nd
cis-1,2-Dichloroethene	1.0	nd			nd	nd	1.0	nd
2,2-Dichloropropane	1.0	nd			nd	nd	nd	nd
Chloroform	1.0	nd	84%	102%	nd	nd	nd	nd
Bromochloromethane	1.0	nd			nd	nd	nd	nd
1,1,1-Trichloroethane	1.0	nd			nd	nd	nd	nd
1,2-Dichloroethane (EDC)	1.0	nd			nd	nd	nd	nd
1,1-Dichloropropene	1.0	nd			nd	nd	nd	nd
Carbon tetrachloride	1.0	nd			nd	nd	nd	nd
Trichloroethene (TCE)	1.0	nd	81%	98%	nd	nd	5.3	nd
1,2-Dichloropropane	1.0	nd			nd	nd	nd	nd
Bromodichloromethane	1.0	nd			nd	nd	nd	nd
cis-1,3-Dichloropropene	1.0	nd			nd	nd	nd	nd
trans-1,3-Dichloropropene	1.0	nd			nd	nd	nd	nd
1,1,2-Trichloroethane	1.0	nd			nd	nd	nd	nd
1,3-Dichloropropane	1.0	nd			nd	nd	nd	nd
Dibromochloromethane	1.0	nd			nd	nd	nd	nd
Tetrachloroethene (PCE)	1.0	nd	83%	103%	nd	14	35	nd
Chlorobenzene	1.0	nd	77%	92%	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	1.0	nd			nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	1.0	nd			nd	nd	nd	nd
1,2,3-Trichloropropane	1.0	nd			nd	nd	nd	nd
2-Chlorotoluene	1.0	nd			nd	nd	nd	nd
4-Chlorotoluene	1.0	nd			nd	nd	nd	nd
1,3-Dichlorobenzene	1.0	nd			nd	nd	nd	nd
1,4-Dichlorobenzene	1.0	nd			nd	nd	nd	nd
1,2-Dichlorobenzene	1.0	nd			nd	nd	nd	nd
1,2-Dibromo-3-Chloropropane	1.0	nd			nd	nd	nd	nd
1,2,4-Trichlorobenzene	1.0	nd			nd	nd	nd	nd
Hexachloro-1,3-butadiene	1.0	nd			nd	nd	nd	nd
1,2,3-Trichlorobenzene	1.0	nd			nd	nd	nd	nd
<b>Surrogate recoveries</b>								
Dibromofluoromethane		113%	127%	118%	122%	123%	130%	131%
Toluene-d8		99%	98%	99%	99%	100%	97%	92%
4-Bromofluorobenzene		99%	97%	95%	93%	96%	96%	93%

### Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits  
 Acceptable Recovery limits: 65% TO 135%  
 Acceptable RPD limit: 35%

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## Analysis of Chlorinated Volatile Organic Compounds in Water by Method 8260C/5030C

### Analytical Results

Date analyzed	RL (ug/L)	B5-Water 02/10/16	Trip Blank 02/10/16
Dichlorodifluoromethane	1.0	nd	nd
Chloromethane	1.0	nd	nd
Vinyl chloride	0.2	nd	nd
Chloroethane	1.0	nd	nd
Trichlorofluoromethane	1.0	nd	nd
1,1-Dichloroethene	1.0	nd	nd
Methylene chloride	1.0	nd	nd
trans-1,2-Dichloroethene	1.0	nd	nd
1,1-Dichloroethane	1.0	nd	nd
cis-1,2-Dichloroethene	1.0	nd	nd
2,2-Dichloropropane	1.0	nd	nd
Chloroform	1.0	nd	nd
Bromochloromethane	1.0	nd	nd
1,1,1-Trichloroethane	1.0	nd	nd
1,2-Dichloroethane (EDC)	1.0	nd	nd
1,1-Dichloropropene	1.0	nd	nd
Carbon tetrachloride	1.0	nd	nd
Trichloroethene (TCE)	1.0	nd	nd
1,2-Dichloropropane	1.0	nd	nd
Bromodichloromethane	1.0	nd	nd
cis-1,3-Dichloropropene	1.0	nd	nd
trans-1,3-Dichloropropene	1.0	nd	nd
1,1,2-Trichloroethane	1.0	nd	nd
1,3-Dichloropropane	1.0	nd	nd
Dibromochloromethane	1.0	nd	nd
Tetrachloroethene (PCE)	1.0	nd	nd
Chlorobenzene	1.0	nd	nd
1,1,1,2-Tetrachloroethane	1.0	nd	nd
1,1,2,2-Tetrachloroethane	1.0	nd	nd
1,2,3-Trichloropropane	1.0	nd	nd
2-Chlorotoluene	1.0	nd	nd
4-Chlorotoluene	1.0	nd	nd
1,3-Dichlorobenzene	1.0	nd	nd
1,4-Dichlorobenzene	1.0	nd	nd
1,2-Dichlorobenzene	1.0	nd	nd
1,2-Dibromo-3-Chloropropane	1.0	nd	nd
1,2,4-Trichlorobenzene	1.0	nd	nd
Hexachloro-1,3-butadiene	1.0	nd	nd
1,2,3-Trichlorobenzene	1.0	nd	nd

### Surrogate recoveries

Dibromofluoromethane	128%	129%
Toluene-d8	100%	93%
4-Bromofluorobenzene	93%	94%

### Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits  
 Acceptable Recovery limits: 65% TO 135%  
 Acceptable RPD limit: 35%

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## Analysis of Chlorinated Volatile Organic Compounds in Soil by Method 8260C/5035

	RL	MB	LCS	LCSD	B3-15
Date extracted		02/08/16	02/08/16	02/08/16	02/04/16
Date analyzed	(mg/Kg)	02/08/16	02/08/16	02/08/16	02/18/16
% Moisture					
Dichlorodifluoromethane	0.05	nd			nd
Chloromethane	0.05	nd			nd
Vinyl chloride	0.02	nd	116%	91%	nd
Chloroethane	0.05	nd			nd
Trichlorofluoromethane	0.05	nd			nd
1,1-Dichloroethene	0.05	nd	82%	66%	nd
Methylene chloride	0.05	nd			nd
trans-1,2-Dichloroethene	0.05	nd			nd
1,1-Dichloroethane	0.05	nd			nd
cis-1,2-Dichloroethene	0.05	nd			nd
2,2-Dichloropropane	0.05	nd			nd
Chloroform	0.05	nd	120%	94%	nd
Bromochloromethane	0.05	nd			nd
1,1,1-Trichloroethane	0.05	nd			nd
1,2-Dichloroethane (EDC)	0.05	nd			nd
1,1-Dichloropropene	0.05	nd			nd
Carbon tetrachloride	0.05	nd			nd
Trichloroethene (TCE)	0.02	nd	124%	103%	nd
1,2-Dichloropropane	0.05	nd	129%	100%	nd
Bromodichloromethane	0.05	nd			nd
cis-1,3-Dichloropropene	0.05	nd			nd
trans-1,3-Dichloropropene	0.05	nd			nd
1,1,2-Trichloroethane	0.05	nd			nd
1,3-Dichloropropane	0.05	nd			nd
Dibromochloromethane	0.05	nd			nd
Tetrachloroethene (PCE)	0.02	nd	128%	106%	<b>0.10</b>
Chlorobenzene	0.05	nd	130%	106%	nd
1,1,1,2-Tetrachloroethane	0.05	nd			nd
1,1,2,2-Tetrachloroethane	0.05	nd			nd
1,2,3-Trichloropropane	0.05	nd			nd
2-Chlorotoluene	0.05	nd			nd
4-Chlorotoluene	0.05	nd			nd
1,3-Dichlorobenzene	0.05	nd			nd
1,4-Dichlorobenzene	0.05	nd			nd
1,2-Dichlorobenzene	0.05	nd			nd
1,2-Dibromo-3-Chloropropane	0.05	nd			nd
1,2,4-Trichlorobenzene	0.05	nd			nd
Hexachloro-1,3-butadiene	0.05	nd			nd
1,2,3-Trichlorobenzene	0.05	nd			nd
Surrogate recoveries					
Dibromofluoromethane		98%	98%	95%	96%
Toluene-d8		101%	97%	99%	103%
4-Bromofluorobenzene		104%	98%	99%	103%

### Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits

Acceptable Recovery limits: 65% TO 135%

Acceptable RPD limit: 35%

2/16/2016

Mr. Steve Loague  
ESN Northwest  
1210 Eastside St  
SE Suite 200  
Olympia WA 98501

Project Name: Chri-Mar Apts.  
Project #: 36005  
Workorder #: 1602170A

Dear Mr. Steve Loague

The following report includes the data for the above referenced project for sample(s) received on 2/9/2016 at Air Toxics Ltd.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Kelly Buettner  
Project Manager

**A Eurofins Lancaster Laboratories Company**

Eurofins Air Toxics, Inc.

180 Blue Ravine Road, Suite B  
Folsom, CA 95630

T | 916-985-1000  
F | 916-985-1020  
[www.airtoxics.com](http://www.airtoxics.com)

**WORK ORDER #: 1602170A**

Work Order Summary

**CLIENT:** Mr. Steve Loague  
 ESN Northwest  
 1210 Eastside St  
 SE Suite 200  
 Olympia, WA 98501

**BILL TO:** Mr. Steve Loague  
 ESN Northwest  
 1210 Eastside St  
 SE Suite 200  
 Olympia, WA 98501

**PHONE:** 360-459-4670

**P.O. #** 36005

**FAX:** 360-4595-3432

**PROJECT #** 36005 Chri-Mar Apts.

**DATE RECEIVED:** 02/09/2016

**CONTACT:** Kelly Buettner

**DATE COMPLETED:** 02/16/2016

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	B-1	TO-15	0.8 "Hg	14.6 psi
02A	B-3	TO-15	3.9 "Hg	14.6 psi
03A	Lab Blank	TO-15	NA	NA
04A	CCV	TO-15	NA	NA
05A	LCS	TO-15	NA	NA
05AA	LCSD	TO-15	NA	NA

CERTIFIED BY:



Technical Director

DATE: 02/16/16

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,  
 TX NELAP - T104704343-14-7, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935  
 Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)  
 Accreditation number: CA300005, Effective date: 10/18/2014, Expiration date: 10/17/2015.  
 Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, Inc.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563  
 (916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

**LABORATORY NARRATIVE**  
**EPA Method TO-15**  
**ESN Northwest**  
**Workorder# 1602170A**

Two 1 Liter Summa Canister samples were received on February 09, 2016. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

**Receiving Notes**

There were no receiving discrepancies.

**Analytical Notes**

There were no analytical discrepancies.

**Definition of Data Qualifying Flags**

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue



Air Toxics

### Summary of Detected Compounds EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: B-1

Lab ID#: 1602170A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	1.0	27	2.3	59
Ethanol	4.1	19	7.7	36
Acetone	10	100	24	240
Carbon Disulfide	4.1	4.2	13	13
Hexane	1.0	12	3.6	42
2-Butanone (Methyl Ethyl Ketone)	4.1	16	12	47
Tetrahydrofuran	1.0	1.3	3.0	3.9
Cyclohexane	1.0	5.2	3.5	18
Benzene	1.0	15	3.3	48
Heptane	1.0	4.4	4.2	18
Toluene	1.0	13	3.9	48
m,p-Xylene	1.0	2.3	4.4	10

Client Sample ID: B-3

Lab ID#: 1602170A-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,3-Butadiene	1.1	73	2.5	160
Acetone	11	70	27	170
Carbon Disulfide	4.6	11	14	35
Hexane	1.1	23	4.0	80
2-Butanone (Methyl Ethyl Ketone)	4.6	10	14	30
Tetrahydrofuran	1.1	1.3	3.4	3.9
Cyclohexane	1.1	8.8	3.9	30
2,2,4-Trimethylpentane	1.1	1.7	5.3	8.1
Benzene	1.1	18	3.6	59
Heptane	1.1	5.8	4.7	24
Trichloroethene	1.1	3.7	6.2	20
Toluene	1.1	12	4.3	47
Tetrachloroethene	1.1	5.6	7.8	38
m,p-Xylene	1.1	2.2	5.0	9.4



Air Toxics

Client Sample ID: B-1

Lab ID#: 1602170A-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3021214	Date of Collection:	2/4/16 9:52:00 AM
Dil. Factor:	2.05	Date of Analysis:	2/12/16 11:01 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.0	Not Detected	5.1	Not Detected
Freon 114	1.0	Not Detected	7.2	Not Detected
Chloromethane	10	Not Detected	21	Not Detected
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,3-Butadiene	1.0	27	2.3	59
Bromomethane	10	Not Detected	40	Not Detected
Chloroethane	4.1	Not Detected	11	Not Detected
Freon 11	1.0	Not Detected	5.8	Not Detected
Ethanol	4.1	19	7.7	36
Freon 113	1.0	Not Detected	7.8	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.1	Not Detected
Acetone	10	100	24	240
2-Propanol	4.1	Not Detected	10	Not Detected
Carbon Disulfide	4.1	4.2	13	13
3-Chloropropene	4.1	Not Detected	13	Not Detected
Methylene Chloride	10	Not Detected	36	Not Detected
Methyl tert-butyl ether	1.0	Not Detected	3.7	Not Detected
trans-1,2-Dichloroethene	1.0	Not Detected	4.1	Not Detected
Hexane	1.0	12	3.6	42
1,1-Dichloroethane	1.0	Not Detected	4.1	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.1	16	12	47
cis-1,2-Dichloroethene	1.0	Not Detected	4.1	Not Detected
Tetrahydrofuran	1.0	1.3	3.0	3.9
Chloroform	1.0	Not Detected	5.0	Not Detected
1,1,1-Trichloroethane	1.0	Not Detected	5.6	Not Detected
Cyclohexane	1.0	5.2	3.5	18
Carbon Tetrachloride	1.0	Not Detected	6.4	Not Detected
2,2,4-Trimethylpentane	1.0	Not Detected	4.8	Not Detected
Benzene	1.0	15	3.3	48
1,2-Dichloroethane	1.0	Not Detected	4.1	Not Detected
Heptane	1.0	4.4	4.2	18
Trichloroethene	1.0	Not Detected	5.5	Not Detected
1,2-Dichloropropane	1.0	Not Detected	4.7	Not Detected
1,4-Dioxane	4.1	Not Detected	15	Not Detected
Bromodichloromethane	1.0	Not Detected	6.9	Not Detected
cis-1,3-Dichloropropene	1.0	Not Detected	4.6	Not Detected
4-Methyl-2-pentanone	1.0	Not Detected	4.2	Not Detected
Toluene	1.0	13	3.9	48
trans-1,3-Dichloropropene	1.0	Not Detected	4.6	Not Detected
1,1,2-Trichloroethane	1.0	Not Detected	5.6	Not Detected
Tetrachloroethene	1.0	Not Detected	7.0	Not Detected
2-Hexanone	4.1	Not Detected	17	Not Detected





Air Toxics

Client Sample ID: B-1

Lab ID#: 1602170A-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3021214	Date of Collection:	2/4/16 9:52:00 AM
Dil. Factor:	2.05	Date of Analysis:	2/12/16 11:01 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.0	Not Detected	8.7	Not Detected
1,2-Dibromoethane (EDB)	1.0	Not Detected	7.9	Not Detected
Chlorobenzene	1.0	Not Detected	4.7	Not Detected
Ethyl Benzene	1.0	Not Detected	4.4	Not Detected
m,p-Xylene	1.0	2.3	4.4	10
o-Xylene	1.0	Not Detected	4.4	Not Detected
Styrene	1.0	Not Detected	4.4	Not Detected
Bromoform	1.0	Not Detected	10	Not Detected
Cumene	1.0	Not Detected	5.0	Not Detected
1,1,2,2-Tetrachloroethane	1.0	Not Detected	7.0	Not Detected
Propylbenzene	1.0	Not Detected	5.0	Not Detected
4-Ethyltoluene	1.0	Not Detected	5.0	Not Detected
1,3,5-Trimethylbenzene	1.0	Not Detected	5.0	Not Detected
1,2,4-Trimethylbenzene	1.0	Not Detected	5.0	Not Detected
1,3-Dichlorobenzene	1.0	Not Detected	6.2	Not Detected
1,4-Dichlorobenzene	1.0	Not Detected	6.2	Not Detected
alpha-Chlorotoluene	1.0	Not Detected	5.3	Not Detected
1,2-Dichlorobenzene	1.0	Not Detected	6.2	Not Detected
1,2,4-Trichlorobenzene	4.1	Not Detected	30	Not Detected
Hexachlorobutadiene	4.1	Not Detected	44	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	106	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	98	70-130



Air Toxics

Client Sample ID: B-3

Lab ID#: 1602170A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3021215	Date of Collection:	2/4/16 12:05:00 PM
Dil. Factor:	2.29	Date of Analysis:	2/12/16 11:28 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	1.1	Not Detected	5.7	Not Detected
Freon 114	1.1	Not Detected	8.0	Not Detected
Chloromethane	11	Not Detected	24	Not Detected
Vinyl Chloride	1.1	Not Detected	2.9	Not Detected
1,3-Butadiene	1.1	73	2.5	160
Bromomethane	11	Not Detected	44	Not Detected
Chloroethane	4.6	Not Detected	12	Not Detected
Freon 11	1.1	Not Detected	6.4	Not Detected
Ethanol	4.6	Not Detected	8.6	Not Detected
Freon 113	1.1	Not Detected	8.8	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.5	Not Detected
Acetone	11	70	27	170
2-Propanol	4.6	Not Detected	11	Not Detected
Carbon Disulfide	4.6	11	14	35
3-Chloropropene	4.6	Not Detected	14	Not Detected
Methylene Chloride	11	Not Detected	40	Not Detected
Methyl tert-butyl ether	1.1	Not Detected	4.1	Not Detected
trans-1,2-Dichloroethene	1.1	Not Detected	4.5	Not Detected
Hexane	1.1	23	4.0	80
1,1-Dichloroethane	1.1	Not Detected	4.6	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.6	10	14	30
cis-1,2-Dichloroethene	1.1	Not Detected	4.5	Not Detected
Tetrahydrofuran	1.1	1.3	3.4	3.9
Chloroform	1.1	Not Detected	5.6	Not Detected
1,1,1-Trichloroethane	1.1	Not Detected	6.2	Not Detected
Cyclohexane	1.1	8.8	3.9	30
Carbon Tetrachloride	1.1	Not Detected	7.2	Not Detected
2,2,4-Trimethylpentane	1.1	1.7	5.3	8.1
Benzene	1.1	18	3.6	59
1,2-Dichloroethane	1.1	Not Detected	4.6	Not Detected
Heptane	1.1	5.8	4.7	24
Trichloroethene	1.1	3.7	6.2	20
1,2-Dichloropropane	1.1	Not Detected	5.3	Not Detected
1,4-Dioxane	4.6	Not Detected	16	Not Detected
Bromodichloromethane	1.1	Not Detected	7.7	Not Detected
cis-1,3-Dichloropropene	1.1	Not Detected	5.2	Not Detected
4-Methyl-2-pentanone	1.1	Not Detected	4.7	Not Detected
Toluene	1.1	12	4.3	47
trans-1,3-Dichloropropene	1.1	Not Detected	5.2	Not Detected
1,1,2-Trichloroethane	1.1	Not Detected	6.2	Not Detected
Tetrachloroethene	1.1	5.6	7.8	38
2-Hexanone	4.6	Not Detected	19	Not Detected



Air Toxics

Client Sample ID: B-3

Lab ID#: 1602170A-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3021215	Date of Collection: 2/4/16 12:05:00 PM
Dil. Factor:	2.29	Date of Analysis: 2/12/16 11:28 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	1.1	Not Detected	9.8	Not Detected
1,2-Dibromoethane (EDB)	1.1	Not Detected	8.8	Not Detected
Chlorobenzene	1.1	Not Detected	5.3	Not Detected
Ethyl Benzene	1.1	Not Detected	5.0	Not Detected
m,p-Xylene	1.1	2.2	5.0	9.4
o-Xylene	1.1	Not Detected	5.0	Not Detected
Styrene	1.1	Not Detected	4.9	Not Detected
Bromoform	1.1	Not Detected	12	Not Detected
Cumene	1.1	Not Detected	5.6	Not Detected
1,1,2,2-Tetrachloroethane	1.1	Not Detected	7.9	Not Detected
Propylbenzene	1.1	Not Detected	5.6	Not Detected
4-Ethyltoluene	1.1	Not Detected	5.6	Not Detected
1,3,5-Trimethylbenzene	1.1	Not Detected	5.6	Not Detected
1,2,4-Trimethylbenzene	1.1	Not Detected	5.6	Not Detected
1,3-Dichlorobenzene	1.1	Not Detected	6.9	Not Detected
1,4-Dichlorobenzene	1.1	Not Detected	6.9	Not Detected
alpha-Chlorotoluene	1.1	Not Detected	5.9	Not Detected
1,2-Dichlorobenzene	1.1	Not Detected	6.9	Not Detected
1,2,4-Trichlorobenzene	4.6	Not Detected	34	Not Detected
Hexachlorobutadiene	4.6	Not Detected	49	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	110	70-130
1,2-Dichloroethane-d4	114	70-130
4-Bromofluorobenzene	100	70-130



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1602170A-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3021206	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/12/16 01:41 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Freon 12	0.50	Not Detected	2.5	Not Detected
Freon 114	0.50	Not Detected	3.5	Not Detected
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,3-Butadiene	0.50	Not Detected	1.1	Not Detected
Bromomethane	5.0	Not Detected	19	Not Detected
Chloroethane	2.0	Not Detected	5.3	Not Detected
Freon 11	0.50	Not Detected	2.8	Not Detected
Ethanol	2.0	Not Detected	3.8	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
2-Propanol	2.0	Not Detected	4.9	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
3-Chloropropene	2.0	Not Detected	6.3	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
Methyl tert-butyl ether	0.50	Not Detected	1.8	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Tetrahydrofuran	0.50	Not Detected	1.5	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Cyclohexane	0.50	Not Detected	1.7	Not Detected
Carbon Tetrachloride	0.50	Not Detected	3.1	Not Detected
2,2,4-Trimethylpentane	0.50	Not Detected	2.3	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
1,2-Dichloroethane	0.50	Not Detected	2.0	Not Detected
Heptane	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
1,2-Dichloropropane	0.50	Not Detected	2.3	Not Detected
1,4-Dioxane	2.0	Not Detected	7.2	Not Detected
Bromodichloromethane	0.50	Not Detected	3.4	Not Detected
cis-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
4-Methyl-2-pentanone	0.50	Not Detected	2.0	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
trans-1,3-Dichloropropene	0.50	Not Detected	2.3	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
2-Hexanone	2.0	Not Detected	8.2	Not Detected



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1602170A-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3021206	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/12/16 01:41 PM

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Dibromochloromethane	0.50	Not Detected	4.2	Not Detected
1,2-Dibromoethane (EDB)	0.50	Not Detected	3.8	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Bromoform	0.50	Not Detected	5.2	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
1,1,2,2-Tetrachloroethane	0.50	Not Detected	3.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
4-Ethyltoluene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,3-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,4-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
alpha-Chlorotoluene	0.50	Not Detected	2.6	Not Detected
1,2-Dichlorobenzene	0.50	Not Detected	3.0	Not Detected
1,2,4-Trichlorobenzene	2.0	Not Detected	15	Not Detected
Hexachlorobutadiene	2.0	Not Detected	21	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	102	70-130



Air Toxics

Client Sample ID: CCV

Lab ID#: 1602170A-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3021202	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/12/16 12:01 PM

Compound	%Recovery
Freon 12	102
Freon 114	98
Chloromethane	102
Vinyl Chloride	101
1,3-Butadiene	94
Bromomethane	104
Chloroethane	99
Freon 11	99
Ethanol	105
Freon 113	98
1,1-Dichloroethene	100
Acetone	100
2-Propanol	105
Carbon Disulfide	101
3-Chloropropene	100
Methylene Chloride	101
Methyl tert-butyl ether	101
trans-1,2-Dichloroethene	103
Hexane	101
1,1-Dichloroethane	103
2-Butanone (Methyl Ethyl Ketone)	98
cis-1,2-Dichloroethene	99
Tetrahydrofuran	100
Chloroform	100
1,1,1-Trichloroethane	98
Cyclohexane	100
Carbon Tetrachloride	98
2,2,4-Trimethylpentane	101
Benzene	97
1,2-Dichloroethane	101
Heptane	96
Trichloroethene	97
1,2-Dichloropropane	94
1,4-Dioxane	97
Bromodichloromethane	99
cis-1,3-Dichloropropene	100
4-Methyl-2-pentanone	98
Toluene	95
trans-1,3-Dichloropropene	102
1,1,2-Trichloroethane	95
Tetrachloroethene	99
2-Hexanone	99



Air Toxics

Client Sample ID: CCV

Lab ID#: 1602170A-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3021202	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/12/16 12:01 PM

Compound	%Recovery
Dibromochloromethane	99
1,2-Dibromoethane (EDB)	99
Chlorobenzene	97
Ethyl Benzene	100
m,p-Xylene	102
o-Xylene	99
Styrene	102
Bromoform	104
Cumene	100
1,1,2,2-Tetrachloroethane	98
Propylbenzene	98
4-Ethyltoluene	99
1,3,5-Trimethylbenzene	99
1,2,4-Trimethylbenzene	100
1,3-Dichlorobenzene	98
1,4-Dichlorobenzene	96
alpha-Chlorotoluene	101
1,2-Dichlorobenzene	94
1,2,4-Trichlorobenzene	101
Hexachlorobutadiene	100

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	103	70-130



Air Toxics

Client Sample ID: LCS

Lab ID#: 1602170A-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3021203	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/12/16 12:25 PM

Compound	%Recovery	Method Limits
Freon 12	107	70-130
Freon 114	104	70-130
Chloromethane	103	70-130
Vinyl Chloride	107	70-130
1,3-Butadiene	97	70-130
Bromomethane	107	70-130
Chloroethane	105	70-130
Freon 11	102	70-130
Ethanol	105	70-130
Freon 113	97	70-130
1,1-Dichloroethene	102	70-130
Acetone	102	70-130
2-Propanol	108	70-130
Carbon Disulfide	91	70-130
3-Chloropropene	99	70-130
Methylene Chloride	104	70-130
Methyl tert-butyl ether	101	70-130
trans-1,2-Dichloroethene	107	70-130
Hexane	103	70-130
1,1-Dichloroethane	106	70-130
2-Butanone (Methyl Ethyl Ketone)	99	70-130
cis-1,2-Dichloroethene	101	70-130
Tetrahydrofuran	100	70-130
Chloroform	102	70-130
1,1,1-Trichloroethane	100	70-130
Cyclohexane	102	70-130
Carbon Tetrachloride	100	70-130
2,2,4-Trimethylpentane	104	70-130
Benzene	98	70-130
1,2-Dichloroethane	102	70-130
Heptane	98	70-130
Trichloroethene	100	70-130
1,2-Dichloropropane	97	70-130
1,4-Dioxane	94	70-130
Bromodichloromethane	103	70-130
cis-1,3-Dichloropropene	96	70-130
4-Methyl-2-pentanone	96	70-130
Toluene	97	70-130
trans-1,3-Dichloropropene	101	70-130
1,1,2-Trichloroethane	95	70-130
Tetrachloroethene	98	70-130
2-Hexanone	97	70-130





Air Toxics

Client Sample ID: LCS

Lab ID#: 1602170A-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3021203	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/12/16 12:25 PM

Compound	%Recovery	Method Limits
Dibromochloromethane	101	70-130
1,2-Dibromoethane (EDB)	100	70-130
Chlorobenzene	97	70-130
Ethyl Benzene	97	70-130
m,p-Xylene	99	70-130
o-Xylene	100	70-130
Styrene	102	70-130
Bromoform	105	70-130
Cumene	100	70-130
1,1,1,2-Tetrachloroethane	98	70-130
Propylbenzene	99	70-130
4-Ethyltoluene	99	70-130
1,3,5-Trimethylbenzene	98	70-130
1,2,4-Trimethylbenzene	100	70-130
1,3-Dichlorobenzene	98	70-130
1,4-Dichlorobenzene	96	70-130
alpha-Chlorotoluene	105	70-130
1,2-Dichlorobenzene	94	70-130
1,2,4-Trichlorobenzene	102	70-130
Hexachlorobutadiene	104	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	102	70-130
4-Bromofluorobenzene	102	70-130



Air Toxics

Client Sample ID: LCSD

Lab ID#: 1602170A-05AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3021204	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/12/16 12:50 PM

Compound	%Recovery	Method Limits
Freon 12	104	70-130
Freon 114	102	70-130
Chloromethane	102	70-130
Vinyl Chloride	106	70-130
1,3-Butadiene	95	70-130
Bromomethane	104	70-130
Chloroethane	102	70-130
Freon 11	101	70-130
Ethanol	109	70-130
Freon 113	95	70-130
1,1-Dichloroethene	101	70-130
Acetone	98	70-130
2-Propanol	106	70-130
Carbon Disulfide	90	70-130
3-Chloropropene	95	70-130
Methylene Chloride	101	70-130
Methyl tert-butyl ether	99	70-130
trans-1,2-Dichloroethene	103	70-130
Hexane	102	70-130
1,1-Dichloroethane	103	70-130
2-Butanone (Methyl Ethyl Ketone)	96	70-130
cis-1,2-Dichloroethene	97	70-130
Tetrahydrofuran	99	70-130
Chloroform	101	70-130
1,1,1-Trichloroethane	98	70-130
Cyclohexane	100	70-130
Carbon Tetrachloride	97	70-130
2,2,4-Trimethylpentane	102	70-130
Benzene	98	70-130
1,2-Dichloroethane	100	70-130
Heptane	96	70-130
Trichloroethene	99	70-130
1,2-Dichloropropane	96	70-130
1,4-Dioxane	96	70-130
Bromodichloromethane	101	70-130
cis-1,3-Dichloropropene	95	70-130
4-Methyl-2-pentanone	95	70-130
Toluene	97	70-130
trans-1,3-Dichloropropene	101	70-130
1,1,2-Trichloroethane	95	70-130
Tetrachloroethene	98	70-130
2-Hexanone	96	70-130



Air Toxics

Client Sample ID: LCSD

Lab ID#: 1602170A-05AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	3021204	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 2/12/16 12:50 PM

Compound	%Recovery	Method Limits
Dibromochloromethane	101	70-130
1,2-Dibromoethane (EDB)	99	70-130
Chlorobenzene	97	70-130
Ethyl Benzene	98	70-130
m,p-Xylene	99	70-130
o-Xylene	102	70-130
Styrene	102	70-130
Bromoform	105	70-130
Cumene	99	70-130
1,1,2,2-Tetrachloroethane	98	70-130
Propylbenzene	99	70-130
4-Ethyltoluene	98	70-130
1,3,5-Trimethylbenzene	101	70-130
1,2,4-Trimethylbenzene	100	70-130
1,3-Dichlorobenzene	98	70-130
1,4-Dichlorobenzene	96	70-130
alpha-Chlorotoluene	104	70-130
1,2-Dichlorobenzene	94	70-130
1,2,4-Trichlorobenzene	108	70-130
Hexachlorobutadiene	107	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	102	70-130