

XCG CONSULTING LIMITED T 780 432 5770 | edmonton@xcg.com 10455 - 84th Avenue, Edmonton, Alberta, Canada T6E 2H3

APEGA Permit: P13141

June 5, 2017

XCG File No. 4-2352-04-03

Ms. Janet Whitesell Solid Waste Superintendent Environmental Services Department City of Red Deer Box 5008 – 7721 40 Avenue Red Deer, Alberta T4N 3T4

Re: Indoor Air Quality Sampling and Assessment at Select Residences in the Vicinity of the Former Montfort Landfill, Red Deer, Alberta

Dear Ms. Whitesell:

1. INTRODUCTION, PURPOSE, AND USE

XCG Consulting Limited (XCG) was retained by the City of Red Deer (City) to implement a vapour intrusion assessment and environmental monitoring program at the Montfort Landfill (Site), as per XCG's proposals dated August 23, 2016 and November 7, 2016.

The objective of the indoor air quality (IAQ) assessment was to determine whether the volatile organic compounds (VOCs) detected in groundwater and soil vapour on, and immediately adjacent to, the Site are migrating to indoor air and adversely affecting the adjacent off-site residential indoor air quality.

This report has been prepared for the exclusive use of The City of Red Deer and may not be relied upon by any other person or entity without written authorization of XCG.

2. BACKGROUND

The Montfort Landfill is reported to have been in operation in 1968 and 1969, accepting municipal solid waste from the City. After the Site was closed, and prior to the changes in regulation prohibiting residential encroachment to closed landfill sites, numerous residences/buildings were developed adjacent to the Site. In 2015, the City undertook a Phase I Environmental Site Assessment (ESA), a Phase II ESA, and an Environmental Risk Management Plan (ERMP) for the Site. These studies indicated that additional environmental monitoring and investigations were required to determine the potential for landfill gases to impact the homes and residents neighbouring the Site. The locations of the monitoring wells and soil vapour probes are shown on Figure 1.

XCG understands that the City of Red Deer offered indoor air quality monitoring to all residents living within a 100-metre radius of the subject property, of which, 22 residents requested the monitoring.



- Implementing a phased approach, XCG recommended assessing indoor air quality at 11 of the above-noted 22 properties that are located immediately adjacent to the Site, (Residence A through Residence K).
- Although included in the 11 proposed testing locations, indoor air quality testing was not conducted at Residence K because the resident was away for an extended period of time. Therefore, the first phase of monitoring was designed to establish whether there is evidence of Site-related impacts at the above-mentioned 10 adjacent properties, the results of which are documented in this letter report. Based on the results of this first phase of indoor air monitoring, additional recommendations will be made regarding additional indoor air monitoring for properties located further away from the Site.

The following sections describe the sampling activities and the analytical results for indoor air samples collected by XCG personnel in select residential buildings located on properties adjacent to the Site on March 13 through March 14, 2017. The indoor air sampling and quality assessment described below were completed in general accordance with the work plan presented in a document entitled "Proposed Investigation Program, Montfort Landfill, Red Deer, Alberta," dated April 11, 2017 (Revised Work Plan).

3. IDENTIFICATION OF CONTAMINANTS OF CONCERN

The indoor air quality assessment program was designed to measure the concentrations of select VOCs, collectively referred to hereafter as the contaminants of concern (COCs), in indoor air samples collected in the basements of residential dwellings located adjacent to the Site. The potential COCs in indoor air were determined based on groundwater and soil vapour testing conducted in conjunction with the indoor air sampling.

The groundwater and soil vapour sampling was completed to provide a baseline characterization of leachate derived VOCs which could be present in the soil vapour on and immediately adjacent to the Site. The parameters detected in soil vapour were screened (using a deminimus approach) to determine which parameters had the potential to impact indoor air based on concentrations present in the soil vapour. Parameters detected in soil vapour that exceeded the deminimus soil vapour criteria were identified as potential COCs in indoor air. Both soil vapour and indoor air sampling activities were conducted while the ground was frozen (i.e. while natural venting from the ground is limited), to assess worst case scenario concentrations of VOCs.

The following sections discuss the findings of the soil vapour deminimus screening and indoor air sampling undertaken in March 2017. Detailed results of the complete soil vapour and groundwater quality assessment will be provided under separate cover following completion of the three additional quarterly monitoring events.

3.1 Assessment Criteria

3.1.1 Indoor Air Quality Criteria

Indoor Air Quality Criteria were derived for each COC based on toxicity reference values as published in Table A-7 Human Toxicity Reference Values (TRVs) of the Alberta Environment publication entitled "Alberta Tier 2 Soil and Groundwater Remediation Guidelines," dated February 2, 2016 (Alberta Tier 2 Guidelines). For COCs that did not have TRVs published in



the Alberta Tier 2 Guidelines and for contaminants with more recent toxicological data, conservative TRVs were selected from Canadian Council of Ministers of the Environment (CCME) or the United States Environmental Protection Agency (USEPA) Integrated Risk Information System (IRIS). The selected TRVs are summarized in Attachment A (Table A1) and were discussed with Alberta Environment and Parks (AEP) and Alberta Health Services (AHS) personnel prior to finalizing the list.

The allowable health based indoor air concentration was calculated for each COC using the selected TRV for that contaminant. In order to be conservative, and as directed by AEP, exposure pro-rating was not utilized to adjust the allowable limits. Candidate indoor air concentrations were calculated for both threshold and non-threshold effects and the lowest risk level was selected as the allowable health based indoor air concentration (see Attachment A, Table A2).

Methane in indoor air was assessed based on the "Draft Soil and Building Methane Gas Management Guide," dated October 2013 and prepared by Alberta Health Services (AHS, 2013). A trigger value of between 2,500 and <5,000 parts per million by volume (ppmv) [5.0 to <10.0 % lower explosive limit (LEL)] was selected for indoor air. As recommended in Table 7 of the AHS 2013 document, indoor methane concentrations detected in this range (2,500 and <5,000 ppmv) require a detailed indoor air monitoring program be completed throughout the building, and methane mitigation strategies be implemented (sealing cracks, service entry points, etc.). Concentrations >5,000 ppmv (>10 % LEL) will require building evacuation and ventilation to remove explosion hazard.

3.1.2 Soil Vapour Deminimus Screening

Soil vapour results were screened using a deminimus approach. A default soil vapour attenuation coefficient of 0.01 was applied in order to conservatively screen soil vapour concentrations as follows:

$$Csv_{Deminimus} = \frac{Cair}{alpha}$$

where

CsvDeminimus	= Deminimus Concentration of Soil Vapour
Cair	= Health Based Indoor Air Criteria (as discussed in 3.1.2 above)
alpha	= deminimus vapour attenuation coefficient 0.01 (as directed by AEP).

The deminimus soil vapour criteria calculations are shown in Attachment A (Table A3). As discussed above, if a parameter was detected in soil vapour at a concentration exceeding the deminimus soil vapour screening criteria, analyses in indoor air was required for the parameter. If the deminimus modelling did not exceed the deminimus soil vapour criteria, then analyses for the parameter was not analyzed for in indoor air even if it was detected in soil vapour.

Methane in soil vapour will also be assessed in accordance with the AHS 2013 document. Based on this guidance document a soil vapour screening level for soil methane adjacent to a building is between 1,000 and 5,000 ppm at soil gas pressures between 0.10 to <0.50 psi. As



recommended in Table 6 of the AHS 2013 document, further investigation and site characterization is recommended when methane is detected in these ranges.

Screening values for soil vapour for propane, ethane and ethylene were derived based on National Institute for Occupational Safety and Health (NIOSH) recommended exposure limits (REL) as listed in Attachment A3. The soil vapour screening values for these parameters were derived assuming that no vapour attenuation occurs.

Soil vapour results for fixed gases and petroleum hydrocarbons, VOCs, and siloxanes are tabulated in Attachment A (Tables A4, A5, and A6, respectively). Worst case concentrations of each parameter detected in the soil vapour were tabulated to compare to the calculated deminimus soil vapour screening criteria as illustrated in Attachment A (Table A7). Based on the comparison, only methane, vinyl chloride and cis-1,2-dichloroethylene (cis-1,2-DCE) were requested for analyses in the indoor and ambient air samples.

3.1.3 Additional Considerations Based on Groundwater Data

It should be noted that in addition to the consideration of the deminimus soil vapour calculations, 1,3,5-trichlorobenzene was detected in groundwater at monitoring well location MW-06 at a concentration of 0.73 μ g/L. This compound is not part of the standard laboratory VOC analyses package for vapour as it exists as a solid at standard temperature and pressure. 1,3,5-trichlorobenzene was not detected at this location during previous sampling events, and was not detected anywhere else on the Site. Borehole logs for MW-06 are not available, but given the groundwater quality and both the odour and colour of the groundwater at this location, it is assumed that this monitoring well is situated within the limit of waste. Calculations using Henry's Law to determine what the maximum soil vapour concentration would be based on the known groundwater concentration partitioning into soil vapour resulted in a calculated concentration of 56.7 μ g/m³. The calculated soil vapour screening value for 1,3,5-trichlorobenzene is 72 μ g/m³. As a result of the fact that this monitoring well is likely within the limit of waste as well as the fact that the soil vapour value immediately above the groundwater-vapour interface is less than the soil vapour screening value, XCG elected not to request 1,3,5-trichlorobenzene data for indoor air. The Henry's Law calculations are provided at the bottom of Table A7 in Attachment A.

4. INDOOR AIR QUALITY ASSESSMENT

The indoor air quality assessment program was designed to measure the concentrations of select VOCs, in samples of whole air collected in the basements of residential dwellings located adjacent to the Site. The XCG SOP for Indoor Air Sampling is included in Attachment B.

The design of the investigation was developed, in part, using information contained within the following guidance manuals:

- Alberta Environment and Parks (AEP), "Alberta Tier 2 Soil and Groundwater Remediation Guidelines," dated 2016.
- CH2M Gore & Storrie Limited, "Guidance Document on the Management of Methane Gas Adjacent to Landfills," dated December 1999.



- Canadian Council of Ministers of the Environment (CCME), "A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures via Inhalation of Vapours," dated 2014
- Alberta Health Services, "Draft Soil and Building Methane Gas Management Guide," dated October 2013; and
- Health Canada, "Federal Contaminated Site Risk Assessment in Canada, Part VII Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites," dated 2010.

4.1 Preliminary Inspections

Prior to commencing indoor air sampling on March 13, 2017, XCG personnel completed preliminary inspections in all of the residential dwellings. During the preliminary inspections, XCG personnel were accompanied by the residential property owners. The building surveys were completed to identify potential background sources of chemicals and to assess building conditions that may influence indoor air quality. The building surveys were conducted a minimum of 48 hours prior to the start of the indoor air sampling. This allowed XCG personnel to identify any potential sources of indoor air contamination which could potentially bias the indoor air sampling results, and to make recommendations regarding the elimination of the source (to the extent practical).

The pre-sampling surveys also allowed XCG personnel to confirm the sample locations with the occupants ahead of the scheduled sampling day.

Pertinent key observations made in the basements of the on-site dwellings and recommendations made during the preliminary inspections are summarized in Table 1, below.

Date of Initial Inspection	Finishes	Preferential Pathways	Observations & Actions
Residence A			
06/12/16	Basement has finished floors (tile, carpet) and walls. Layout encompasses a larger living room area, washroom, bedrooms, and a utility room.	Sanitary stack runs through floor outside of utility room. Floor drain outside of utility room.	No recommended actions.
Residence B	· · · ·	· · · · ·	·
05/12/16	Basement has finished floors (carpet) and walls except for the utility room. Layout encompasses a larger living room area, washroom, bedrooms, laundry room, and a utility room off the laundry room.	Sanitary stack runs through floor in utility room. Floor drain in utility room.	Paints and thinners in a cupboard in another room in basement. Recommended to not open paints in basement until after sampling. Cans of insecticides, window cleaners, etc. in laundry room. These were moved to the garage prior to the sampling event.

 Table 1
 Observations documented during Preliminary Site Inspections





Date of Initial	Finishes	Preferential Pathways	Observations & Actions
Inspection			
Residence C			
06/12/16	Basement has finished floors (tile, carpet) and walls except for utility room. Layout is completely open other than wall/hall dividing stairwell from rest of basement. New carpeting on main level installed November 2016.	Sanitary stack runs through floor near furnace. Floor drain near furnace.	Tubes of acrylic paint present (hobby sized). Not opened for long time. Recommended to keep closed until after sampling.
Residence D			
05/12/16	Basement has finished floors (linoleum) and walls except for crawlspace. Layout is open other than half of basement is a crawlspace which has a door separating it from the rest of the basement.	Sanitary stack runs through floor near furnace. No visible floor drain- possibly present under furniture or utilities.	No recommended actions.
Residence E			
06/12/16	Basement has finished floors (carpet) and walls in approximately two-thirds of area. Layout encompasses a living room area, a bedroom, a storage area/crawlspace, and a utility room situated off the bedroom.	Sanitary stack runs through floor in utility room. Floor drain in utility room. Several cracks visible in slab in storage area. Movement of air between storage area and the utility room is possible even with the doors closed to both areas.	At least one member of the household smokes cigarettes in the house. Basement bedroom is occupied full time, therefore personal hygiene products (deodorant, etc.) present. Ductwork in crawl space formerly directly connected to garage above. Homeowner sealed off. No recommended actions.
Residence F			
06/12/16	Basement has finished floors (tile, carpet) and walls except for utility room. Layout encompasses a larger living room area, washroom, small storage room, and utility room. New flooring, carpeting on main level installed November 2016. Renovations within the week prior to sampling included new woodwork and the use of low VOC paint in the basement (Minwax water-based Wood Stain).	Sanitary stack runs through floor in utility room. Floor drain in utility room. 0.6m x 0.6m piece of plywood covering hole through slab in craft room in basement. Appears to be native clay below.	Household cleaners in basement moved to garage before sampling event
Residence G			
06/12/16	Basement has finished floors (carpet) and walls except for utility room. Layout encompasses a larger living room area, washroom, small storage room, and utility room.	Sanitary stack runs through floor in utility room. Floor drain in utility room.	Bleach powder under sink in basement washroom. No recommended actions.



Date of Initial Inspection	Finishes	Preferential Pathways	Observations & Actions
Residence H		-	
06/12/16	Basement unfinished - Concrete floor slab and studs visible. Basement completely open - no dividing walls.	Sanitary stack and floor drain near furnace. Minor crack in slab.	No recommended actions.
Residence I	•		•
09/03/17	Basement has finished floors (carpet) and walls except for the utility area. Layout encompasses a larger living room area, washroom, laundry room, and a utility room off the laundry room.	Sanitary stack and floor drain near furnace. Minor crack in slab.	No recommended actions.
Residence J			
09/03/17	Basement has finished floors (carpet) and walls except for the utility area. Layout encompasses a larger living room area, washroom, and a laundry/utility room.	Sanitary stack and floor drain near furnace. Minor cracks in slab.	Removed household cleaning products from the laundry/utility room prior to sampling.

General notes:

- All residential windows were closed prior to and during the sampling events. Minimal traffic occurred through the doors. Sample locations were not directly connected to exterior access points.
- All residences are connected to a garage.
- All residences have fireplaces, either gas or wood-burning.
- The floor slabs were not completely visible in any of the basements due to obstructions or flooring materials.

4.2 Sampling Activities

The indoor and outdoor (ambient) air sample collection was completed over a period of 24 hours commencing on March 13, 2017. The sampling was completed in general accordance with the Proposed Investigation Program following XCG's Standard Operating Procedure (SOP) for Indoor Air Quality Sampling using Summa® Canisters. During the commencement of sampling activities on March 13, 2017, XCG was accompanied on-site by the property owners or their appointed representatives.

The sampling locations are shown on Figure 1. The field observations pertinent to the sampling activities are summarized in Attachment C.

The following summarizes the sampling activities conducted between March 13 and March 14, 2017:

• It was ensured that any recommended actions outlined in Table 1, above, had been completed.



- The indoor air sampling was conducted using Summa® Canisters. One Summa® Canisters was deployed in the basement of each of the residences, with the exception of Residence C. Two Summa® Canisters (a primary sample and a duplicate sample) were deployed in the basement of Residence C. In addition to the indoor air samples, XCG also collected a sample of outdoor (ambient) air by deploying one Summa® Canisters on the back porch of Residence I. All samples were collected using laboratory supplied Summa® Canisters with pre-calibrated 24-hour flow regulators.
- The indoor air Summa® Canisters were placed at heights ranging between approximately 1.0 to 1.5 metres above the basement floors.
- The ambient air Summa® Canisters was placed at a height of approximately 2.0 metres above the ground surface.
- The air samples were collected over a period of approximately 24 hours.
- The heating systems were running as normal at all of the locations with the exception of Residence G because the homeowners were away and had turned the thermostat down a few degrees.
- The concentrations of total organic vapours (TOVs) in the basements were measured using a handheld Photoionization Detector (PID) RKI Eagle 2, and ranged between 0 and 3 parts per million (ppm).
- The concentrations of methane, oxygen and carbon dioxide in the basements were measured using a Landtech GEM-2000 Gas Analyzer. Methane concentrations ranged between 0 and 0.1 % (v/v), oxygen concentrations ranged between 20.8 and 21.6 % (v/v) and carbon dioxide concentrations consistently measured 0.1% (v/v).
- Attachment C contains the field notes for the sample collection, which provide details related to additional observations, meteorological conditions, sampling time, and canister vacuums at the commencement and upon completion of the sampling activities.
- The trip blank canister was also the trip blank sample used for the soil vapour sampling, as all of the canisters were shipped together and kept together for the duration of the sampling and while in transit.
- The canisters containing the indoor and outdoor air samples were submitted under Chain of Custody protocol on March 15, 2017 to Maxxam Analytics Inc. (Maxxam). Maxxam is accredited by the Standards Council of Canada (SCC). Samples were placed on hold until the analytical results for both the groundwater and soil vapour samples were reviewed to determine the list of parameters which would be investigated in the indoor air and ambient air samples.
- Once the preliminary sampling results for groundwater and soil vapour were received, the list of parameters for analyses in the indoor air samples was updated based on the results from soil vapour probes and groundwater monitoring wells.

5. MONITORING RESULTS

The analytical results for the indoor and outdoor air samples are summarized in Table 2 (end of text). Copies of the Laboratory Certificates of Analysis are provided in Attachment D. The following sections provide the summary and the assessment of the sampling results.



Ms. Janet Whitesell City of Red Deer June 5, 2017 Page 9 of 10

5.1 Background (Ambient) Air Quality

Concentrations of methane, vinyl chloride, and cis-1,2-DCE were not detected in ambient air above the laboratory reportable detection limits (RDLs), which were set below the Health Based Indoor Air Criteria.

5.2 Indoor Air Quality

Concentrations of methane, vinyl chloride, and cis-1,2-DCE were not detected in indoor air above the laboratory RDLs in any of the indoor air samples collected from any of the 10 basements. The laboratory RDLs were set below the Health Based Indoor Air Criteria.

Given this information, it is highly unlikely that soil vapour impacted by the landfill is migrating into the indoor air of the residences adjacent to the Site.

5.3 Recommendations

No further monitoring is recommended at this time, either in the residential units where monitoring has already been conducted or in the residences originally proposed for the provisional phase of monitoring. Additional indoor air monitoring recommendations may be included as part of the 2017 Annual Report for the Site once a full year of water levels and soil vapour monitoring data have been collected.

5.4 Quality Assurance/Quality Control (QA/QC) Results

XCG reviewed the laboratory sample results and quality assurance and quality control (QA/QC) samples to evaluate whether data quality objectives were met. The analytical data are considered to be representative, reliable, and complete, and have a documented accuracy and precision. The laboratory sample spikes and QC standard samples analyzed by the laboratory did not reveal any anomalous results.

For the fieldwork program, XCG followed standard QA/QC field protocols, which included cleaning and calibration of sampling equipment, dedicated sampling equipment, unique sample identification and completing chains of custody, recording observations in field notes, and shipping samples to the laboratory as soon as possible after collection, noting the recommended maximum holding times. The soil vapour duplicate field sample had a calculated relative percent difference (RPD) of 92 percent for toluene. No other RPD were calculated for either soil vapour or indoor air as the concentration in the sample or the duplicate was too low to permit a reliable RPD (one or both samples were less than five times the laboratory RDL).

6. CONCLUSIONS

Concentrations of methane, vinyl chloride, and cis-1,2-DCE were not detected in ambient air or in any of the basements of the 10 residences above the laboratory RDLs. The laboratory RDLs were set below the Health Based Indoor Air Criteria. It can be concluded that it is unlikely that soil vapour impacted by the landfill is migrating into the indoor air of the residences adjacent to the Site. No additional recommendations are being made at this time.



7. LIMITATIONS

This report has been prepared for the exclusive use of by the City of Red Deer, and may not be relied upon by any other person or entity without written authorization of XCG. The scope of services performed in the execution of this scope of work may not be appropriate to satisfy the needs of other users, and any use or reuse of this document or the findings, conclusions, or recommendations represented herein is at the sole risk of said users.

Conditions which could not be detected or anticipated at the time of this investigation could influence the findings of this assessment. As such, XCG cannot be held responsible for environmental conditions that were not apparent from the available information.

8. CLOSURE

If you have any questions, comments, or require further assistance, please do not hesitate to contact the undersigned.

Respectfully submitted,

XCG CONSULTING LIMITED

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Mary-Catherine Lanning, B.Sc., M.Sc., P.Geo. Project Specialist

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Pamela Cameron, B.A.Sc., P.Eng., EP(CEA) Senior Project Manager

Attachments: References Figure 1 Table 2 – Summary of Analytical Results for VOCs in Indoor Air Attachment A – Soil Vapour Guidelines and Screening Attachment B - XCG SOP for Indoor Air Sampling Attachment C - Field Notes Attachment D - Laboratory Certificates of Analysis



REFERENCES

- 1. Alberta Environment and Parks (AEP), "Alberta Tier 2 Soil and Groundwater Remediation Guidelines," dated 2016.
- 2. Alberta Health Services, "Draft Soil and Building Methane Gas Management Guide," dated October 2013.
- 3. Atlantic PIRI, RBCA (Risk-Based Corrective Action) Version 2.0 for Petroleum Impacted Sites in Atlantic Canada, "Guidance for Soil Vapour and Indoor Air Monitoring Assessments," dated 2006.
- 4. Canadian Council of Ministers of the Environment (CCME), "Final Scoping Assessment of Soil Vapour Monitoring Protocols for Evaluating Subsurface Vapour Intrusion into Indoor Air," dated July 8, 2008.
- 5. Canadian Council of Ministers of the Environment (CCME), "A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures via Inhalation of Vapours," dated 2014.
- 6. CH2M Gore & Storrie Limited, "Guidance Document on the Management of Methane Gas Adjacent to Landfills," dated December 1999.
- 7. Health Canada, "Federal Contaminated Site Risk Assessment in Canada, Part VII: Guidance for Soil Vapour Intrusion Assessment at Contaminated Sites," dated 2010.
- 8. Ontario Ministry of the Environment, "Draft Technical Guidance: Soil Vapour Intrusion Assessment," dated September 2013.
- 9. Science Advisory Board for Contaminated Sites in British Columbia (SABCS), "Guidance on Site Characterization for Evaluation of Soil Vapour Intrusion into Buildings," report prepared by Golder Associates, dated May 2011.
- 10. Tiamat Environmental Consultants Ltd., "Phase I Environmental Site Assessment Historic Waste Disposal Site Montfort Landfill Site The City of Red Deer," dated September 24, 2013.
- 11. Tiamat Environmental Consultants Ltd., "Phase II Environmental Site Assessment Historic Waste Disposal Site Montfort Landfill Site The City of Red Deer," dated February 26, 2014.
- 12. Tiamat Environmental Consultants Ltd., "Environmental Risk Management Plan Historic Waste Disposal Site Montfort Landfill Site The City of Red Deer," dated November 21, 2014.



FIGURE



DRAWING REFERENCE: Figure based on Phase II ESA (Tiamat Environmental Consultants Ltd., April 2014), City of Red Deer online mapping and XCG field notes. NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.

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TABLE



Table 2 Summary of Analytical Results for VOCs in Indoor Air

								I	ndoor Air Sample	s					Ambient
Sample ID	UNITS	Reportable	Health Based Indoor Air	Residence A/ 2758	Residence B/T21636	Residenc	e C/14258	Residence D/18232	Residence E/129	Residence F/14918	Residence G/14531	Residence H/18260	Residence I/14530	Residence J/2813	OAQ/2595
Laboratory		Detection Limit	Criteria	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam
Laboratory ID				EBG197	EBG194	EBG196	EBG205	EBG201	EBG200	EBG199	EBG198	EBG195	EBG202	EBG203	EBG204
Date Sampled				14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017	14/03/2017
Summa Canister Pressure on Receipt	psig	NV	NV	(-3.9)	(-5.0)	(-4.5)	(-4.5)	(-4.6)	(-4.5)	(-4.0)	(-4.0)	(-3.6)	(-4.5)	(-4.3)	(-2.2)
Vinyl Chloride	μg/m ³	0.0511	1.136	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051	< 0.051
cis-1,2-Dichloroethylene	μg/m ³	0.200	1.790	<0.20	<0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Methane	% v/v	0.1-0.2	0.25-0.5	< 0.1	< 0.2	< 0.2	<0.2	< 0.2	< 0.2	<0.2	< 0.2	<0.2	<0.2	< 0.2	< 0.2
Notes:															
Note 1	Health Based Indoor Air Criteria i	s derived from Risk Asse	essment modelling, wh	nich takes a number of	conservative assumption	ons into consideration.	The Criteria are not re	gulated, rather are indi	cators of possible sour	ces.					
Bold and underline	Parameter concentration exceeds l	Health Based Indoor Air	Criteria for Commerc	ial Use											
NA	Not Applyzed														

Not Analyzed Below Laboratory RDL



ATTACHMENT A SOIL VAPOUR GUIDELINES AND SCREENING

Table A1 Toxicity Reference Values

(List of chemicals is based on parameters with detectable levels in groundwater and soil vapour from Tiamat Environmental Consultants Ltd., Environmental Risk Management Plan (ERMP) and Phase II ESA- Montfort Landfill Site, City of Red Deer)

				Source Allocation Factor			
Chemical	Carcinogen		Tolerable Concentration (TC)	Reference	Inhalation Unit Risk (UR)	Reference	
			(mg/m³)		(mg/m ³) ⁻¹		
trans-1,2-dichloroethylene	N/E		0.009	IRIS 2010 adopted from Oral TRV 0.002 mg/kg/d	-		0.2
1,2-dibromoethane	Likely Carcinogen		0.009	IRIS 2004	0.0006	IRIS 2004	0.2
1,2-dichlorobenzene	N/E		1.92411	Alberta Env [HC (2004) estimated from Oral]	-		0.2
styrene	N/E		0.092	Alberta Env [HC (2004)]	-		0.5
1,3,5-trichloropenzene	N/E Dessible Carsinggen		0.0036	Alberta EnV [HC (2004)]	- 0.000016		0.2
1, 1,2-thchioroethane	Possible Carcinogen		0.018	USEPA 1995 adopted from Ural TRV of 0.004 mg/kg/day	0.000010	USEPA 1995	0.2
Ethane	N/E		813	Occupational Exposure Limit (1000 ppm)	-		
Ethylene	Non-Carcinogen		174	Occupational Exposure Limit (200 ppm)	-		
Methane	Non-Carcinogen		-		-		
Propane	Non-Carcinogen		1800	Occupational Exposure Limit (1000 ppm)	-		1
Dichlorodifluoromethane (Freon 12)	Non-Carcinogen		0.89	IRIS 1987 adopted from Oral TRV 0.2 mg/kg/d	-		0.2
1.2 Habbart flux with an a (D114)	N/C		7000	Alberta ENW Or surretional Engennes Limit			1
1,2-dichlorotetranuoretnane (K114)	N/E Non-Carcinogen		7000	RIS 2001	-		0.2
Vinyl Chloride	Carcinogen		0.1	Alberta Env [USEPA (2006)]	0.0088	Alberta Env [USEPA (2006)]	0.2
Chloroethane	N/E		10	IRIS 1991	-		0.2
Trichlorofluormethane (Freon 11)	Non-Carcinogen		1	(Subchronic) [PPRTV Provisional Peer Review]	-		0.2
Ethanol (Ethyl Alcohol)	Carcinogen		1900	ACGIH exposure Limit (1000 ppm)	-		1
2-Propanol (isopropyl alcohol)	N/E		491 2.00E+01	ACGIH exposure Limit (400 ppm)	-		1
Methyl Ethyl Ketone (2-Butanone)	N/E	Developmental Effects	5.09E+01	IRIS 2003	-		0.2
1.4-dichlorobenzene	Possible Carcinogen	Developmental Effects	0.095	Alberta Env [Health Canada 2004]			0.2
1,1,-dichlorethylene	Possible Carcinogen		0.2	Alberta Env [USEPA (2006)]	-		0.2
cis-1,2-dichloroethylene	N/E		0.009	IRIS 2010 adopted from Oral TRV 0.002 mg/kg/d	-		0.2
methylene chloride (dichloromethane)	Possible Carcinogen		3	Alberta Env [ORNL (2006)]	0.000023	Alberta Env [HC (2004b)]	0.2
chioroionn	Possible Carcinogen		0.028	(modified from HC 2006 oral 1DI)	-		0.2
1,1,1-trichloroethane	N/E		1	MOECC (Cal EPA chREL 2000)	-		0.2
trichloroethylene (updated)	Carcinogen	Developmental Effects	0.04	Alberta Env [CCME 2006]	0.00061	Alberta Env [CCME 2006]	0.2
tetrachloroethylene	Carcinogen		0.04	USEPA IRIS 2012	0.00026	USEPA IRIS 2012	0.2
benzene	Carcinogen		0.03	MOECC (IRIS 2003)	0.0033	Alberta Env [HC (2004b)]	0.2
toluene	Non-Carcinogen		3.8	Alberta Env [HC (2004b)]	-		0.5
Aliphatic C6-C8	Non-Carcinogen		18.4	CCME 2008	-		0.5
Aliphatic C8-C10	Non-Carcinogen		10.4	CCME 2008	-		0.5
Aromatic C8-C10	Non-Carcinogen		0.2	CCME 2008	-		0.5
PHC F2							
Aliphatic C10-C12	Non-Carcinogen		1	CCME 2008	-		0.5
Aliphatic C12-C16	Non-Carcinogen		1	CCME 2008	-		0.5
Aromatic C10-C12 Aromatic C12-C16	Non-Carcinogen		0.2	CCME 2008	-		0.5
raomatic C12-C10	rion-careniogen		0.2		-		0.3
ethylbenzene	Possible Carcinogen	Developmental Effects	1	Alberta Env [USEPA (2006)]	-		0.5
total xylenes	Non-carcinogen		0.18	Alberta Env [HC (2004b)]	-		0.5
1,3,5-trimethylbenzene	Non-carcinogen		0.02	IRIS 2012b DRAFT	-		0.2
1,2,4-trimethylbenzene	Non-carcinogen		0.02	IRIS 2012b DRAFT	-		0.2
hexane	Non-carcinogen		0.7	CCME 2011 DDDTV (DDDTV Drovisional Daar Daview)	-		0.2
cyclohexane	N/E		6	IRIS 2003	-		0.2
tetrahydrofuran	Possible Carcinogen		2	IRIS 2012	-		0.2
propene	N/E		3	CalEPA	-		0.2
2,2,4-trimethylpentane	N/E		64.2	ACGIH exposure Limit (300 ppm)	-		1
carbon disulfide	Non-carcinogen		0.1	Health Canada	-		0.2
trimethylsily] fluoride	N/F						
trimethylsilanol	N/E						
hexamethyl cyclotrisolxane - D3	N/E	İ.		1			
octamethyl cyclotetrasiloxane -D4	N/E						
decamethyl cyclopentasiloxane - D5	N/E						
dodecamethyl cyclohexasiloxane - D6	N/E				l		
Notes N/E Not Evaluated							

Former Montfort Landfill, Red Deer, Alberta



Table A2 Indoor Air Quality Criteria

Non Cancer

Indoor Air Concentration =

TC X SAF X C Non Cancer Pro-rating Factor

Cancer

Indoor Air Concentration =

where:

ion =	CRL x C	
	Cancer Pro-rating Fac	ctor x IUR
Indoor Air Concentration	$\mu g/m^3$	Allowable Indoor Air Concentration
TC	mg/m ³	Tolerable Concentration
IUR	$(mg/m^3)^{-1}$	Inhalation Unit Risk
SAF		Source Allocation Factor
CRL		Cancer Risk Level (assume 1 x 10 ⁻⁵)
С		1,000 µg/mg conversion factor
Pro-rating Factor		Assume no pro-rating for screening level criteria = 1

Developmental Effects

Parameters with inhalation chronic non-cancer toxicity reference values based on reproductive or developmental effects are not pro-rated for exposure. Default exposure is set as 1.

Chemical	Tolerable Concentration (TC)	Inhalation Unit Risk (UR)	Notes		Indoor Air Criteria	(ug/m3)
	(mg/m ³)	(mg/m ³) ⁻¹		threshold	non-threshold	Lowest Risk Level
trans-1,2-dichloroethylene	0.009	-		1.79E+00		1.79E+00
1,2-dibromoethane	0.009	0.0006		1.80E+00	1.67E+01	1.80E+00
1,2-dichlorobenzene	1.924	-		3.85E+02		3.85E+02
styrene	0.092	-		4.60E+01		4.60E+01
1,3,5-trichlorobenzene	0.004	-		7.20E-01		7.20E-01
1,1,2-trichloroethane	0.018	0.000016		3.58E+00	6.25E+02	3.58E+00
Ethane	813	-				1000 ppm (8.13E+5 ug/m3)
Ethylene	174	-				200 ppm (1.74 E+05 ug/m3)
Methane	-	-				2500 to 5000 ppmv (5 to <10 % LEL)
Propane	1800	-		1.80E+06		1000 ppm (1.8 E+6 ug/m3)
Dichlorodifluoromethane (Freon 12)	0.89	-		1.78E+02		1.78E+02
1,2-dichlorotetrafluorethane (R114)	7000	-		7.00E+06		1000 ppm (7.0E+6 ug/m3)
Chloromethane	0.09	-		1.80E+01	1.140.00	1.80E+01
Chloroothono	0.1	0.0088		2.00E+01	1.14E+00	1.14E+00 2.00E+03
Trichlorofluormethane (Freon 11)	1	-		2.00E+03		2.00E+03
	1	-		2.001102		2.0012±02
Ethanol (Ethyl Alcohol)	1900	-		1.90E+06		1 90F.+06
2-Propanol (isopropyl alcohol)	491	-		4.91E+05		4.91E+05
2-Propanone (acetone)	30.9	-		6.18E+03		6.18E+03
Methyl Ethyl Ketone (2-Butanone)	5	-	Developmental Effects	1.00E+03		1.00E+03
1,4-dichlorobenzene	0.095			1.90E+01		1.90E+01
1,1,-dichlorethylene	0.2	-		4.00E+01		4.00E+01
cis-1,2-dichloroethylene	0.008949367	-		1.79E+00		1.79E+00
methylene chloride (dichloromethane)	3	0.000023		6.00E+02	4.35E+02	4.35E+02
chloroform	0.028	-		5.60E+00		5.60E+00
1.1.1.trichlangethene	1			2.005.02		2.005.02
trichloroethylene (undated)	0.04	0.00061		2.00E+02 8.00E+00	1.64E±01	2.00E+02 8.00E+02
tetrachloroethylene	0.04	0.00026	Developmental Effects	8.00E+00	3 85E+01	8 00E+00
benzene	0.03	0.0033		6.00E+00	3.03E+01	3.03E+00
toluene	3.8	-		1.90E+03		1.90E+03
			CCME Soil Subfractions (Tier 1 Table C-10) used to derive F1			
PHC F1			criteria			5.95E+02
Aliphatic C6-C8	18.4	-		9.20E+03		9.20E+03
Aliphatic C8-C10	1	-		5.00E+02		5.00E+02
Aromatic C8-C10	0.2	-		1.00E+02		1.00E+02
			CCME Soil Subfractions (Tier 1 Table C-10) used to derive F1			
PHC F2	1		criteria	5.005.02		2.78E+02
Aliphatic C10-C12	1	-		5.00E+02		5.00E+02
Arometic C12-C18	0.2	-		3.00E+02		5.00E+02
Aromatic C12-C16	0.2	-		1.00E+02		1.00E+02
	0.2			11002102		1002102
ethylbenzene	1	-		5.00E+02		5.00E+02
total xylenes	0.18	-		9.00E+01		9.00E+01
1,3,5-trimethylbenzene	0.02	-		4.00E+00		4.00E+00
1,2,4-trimethylbenzene	0.02	-		4.00E+00		4.00E+00
hexane	0.7	-		1.40E+02		1.40E+02
heptane	0.4	-		8.00E+01		8.00E+01
cyclohexane	6	-		1.20E+03		1.20E+03
tatrahydrafuran				4.000.00		4.000-00
ren anydronuran	2	-		4.00E+02		4.00E+02
2.2.4-trimethylpentane	64.2	-		6.00E+02		6.00E+02
carbon disulfide	0.1	-		2.00E+01		2.00E+01
	0.1	1		2.001101		2.002+01
trimethylsilyl fluoride trimethylsilanol						
hexamethyl cyclotrisolxane - D3		1				
octamethyl cyclotetrasiloxane -D4		1				
decamethyl cyclopentasiloxane - D5						
dodecamethyl cyclohexasiloxane - D6						
1. Methane screening will be completed in accorda	nce with Table 7, Draft Sc	il and Building Meth	ane Gas Management Guide, Oct 201	3, (Alberta Health Servi	ces)	
2. Ethane, Ethylene, Ethanol, 2-Propanol, Propane, 1.2-d	ichlorotetrafluorethane (R114	1), and 2.2.4-trimethylpe	entane criteria adopted from Occupational	Exposure Limits (PEL), as	ssume no dilution/attenuat	ion



Table A3 Derive Acceptable Soil Vapour Concentrations (Soil Vapour Screening Levels)

Deminimus Soil Vapour Criteria were calculated as follows:

$$Csv_{Deminimus} = \frac{Cair}{alpha}$$

where Csv_{Deminimus} = Deminimus Concentration of Soil Vapour

Cair = Health Based Indoor Air Criteria (based on toxicity reference values) Deminimus Alpha = 0.01 (default, as per Alberta Environment)

Soli Vapour Screening (µg/m ²) Soli Vapour Screening (µg/m ²) 12.48broxelsance 1.875+62 179 12.48broxelsance 1.875+62 180 12.55 rubbin vesce 3.555+04 3.852+02 12.55 rubbin vesce 7.205+01 7.2 1.12-vickbordnace 3.555+02 3.830 Binker 7.255+01 7.2 1.12-vickbordnace 3.555+02 3.830 Binker 1.756+05 1.36000 Likkbordnace 3.555+02 3.8300 Binker 1.556+05 1.36000 Likkbordnace 1.365+05 1.36000 Likkbordnace 1.365+05 1.36000 Likkbordnace 1.365+06 1.36000 Likkbordnace 1.365+06 1.3600 Likkbordnace	Chemical	Deminimus Screening	Deminimus Screening
nan:1-2-indisorduyine1.78E-021791.2-dibrootupane1.80E-021.80E1.2-dibrootupane3.88E-043.84E2sayren4.60E-034.60D1.2-dishorbupane7.20E-017.21.1.2-dishorbupane3.58E-028.33000Fisher8.312-058.3300Fisher1.54E-66 (Stationarbupane)1.5000Fisher1.54E-66 (Stationarbupane)1.500000Fisher1.54E-66 (Stationarbupane)1.500000Fisher1.54E-66 (Stationarbupane)1.500000Fisher1.58E-66 (Stationarbupane)1.5000000Fisher1.58E-66 (Stationarbupane)1.5000000Choroutane1.30E-66 (Stationarbupane)1.5000000Choroutane1.30E-66 (Stationarbupane)1.500000Choroutane1.30E-66 (Stationarbupane)1.500000Choroutane1.30E-66 (Stationarbupane)1.50000Choroutane1.30E-66 (Stationarbupane)1.50E-66Choroutane1.30E-66 (Stationarbupane)1.50E-66Choroutane1.30E-66 (Stationarbupane)1.50E-66Choroutane1.30E-66 (Stationarbupane)1.50E-66Choroutane1.30E-66 (Stationarbupane)1.50E-66Choroutane1.30E-66 (Stationarbupane)1.50E-66Choroutane1.30E-66 (Stationarbupane)1.50E-66Choroutane1.30E-66 (Stationarbupane)1.50E-66Choroutane1.30E-66 (Stationarbupane)1.50E-66Choroutane1.30E-66 (Stationarbupane)1.50E-66Choroutane </td <td>Chennical</td> <td>Soil Vapour Screening (µg/m³)</td> <td>Soil Vapour Screening (µg/m³)</td>	Chennical	Soil Vapour Screening (µg/m³)	Soil Vapour Screening (µg/m³)
1.3.480+02 180 1.3.4strikebounzee 3.85±04 38482 1.3.5.strikebounzee 7.20±01 72 1.3.4strikebounzee 7.20±01 72 1.1.2.strikebounzee 3.85±02 358 Blane 8.33±05 8.3000 Bilane 8.33±05 1.30000 Mednac 1.55±6 to 7.6±6 µg/m ¹ 1.500,000 µg/m ¹ Dropas 1.80±06 1800000 Dichosofultoroundhane (Feon 12) 1.78±04 13800 1.2.dichosothane 1.00±06 1000000 Varg) Choirás 1.14±02 1.14 Choroundhane (Feon 12) 1.98±068 1800000 Varg) Choirás 1.14±02 1.14 Choroundhane (Feon 12) 1.98±068 180000 Parguno (fing VArson) 4.91±055 401000 2.dichoroundhane (Feon 12) 1.98±064 1.99±066 Standa (Feon 12) 1.98±063 1.90000 2.dichoroundhane (Feon 12) 6.18±055 6.18900 2.dichoroundhane (Feon 12) 6.18±055 6.180000 </td <td>trans-1,2-dichloroethylene</td> <td>1.79E+02</td> <td>179</td>	trans-1,2-dichloroethylene	1.79E+02	179
1.3 disknowne 3 85%44 3 8482 Agona 4.660 4.600 Agona 7.20%401 7.2 1.1.3-%thinknowne 3.58%402 358 Bilane 3.58%402 358 Bilane 3.13%455 813000 Falylene 1.14%455 113000 Mahane 1.55%46 to <7.65% 4g/m ³ 1.500.000 to <7.660.000 µg/m ³ Propre 1.80%466 1.800000 Dickloordificoranethace (Pron 12) 1.78%494 1.7880 1.40%466 1.800000 7.000000 Cheoranethace (Pron 12) 2.00%405 200000 Cheoranethace (Pron 11) 2.00%404 20000 Cheoranethace (Pron 11) 2.00%405 4.91000 Zhrognol (corpre) skoh) 4.91465 4.91000 Zhrognol (corpre) skoh) 4.91465 6.81800 Zhrognol (corpre) skoh) 4.91465 6.9000 Zhrognol (corpre) skoh) 4.92465 1.90000 Li dicklooranghare 1.96%63 1.9000 Li dicklooranghare 1.96%64	1,2-dibromoethane	1.80E+02	180
system 4.606-03 4600 1,3.5 trichlomhenzee 7.206+01 72 1,3.5 trichlomhenzee 7.206+01 72 LiAndbornebane 8.384+02 358 Ethane 6.136+05 813000 Highere 1.746+05 112000 Mednac 1.564-64 1500000 to <7,600,000 µg/m³	1.2-dichlorobenzene	3.85E+04	38482
3.5 4 vickhookensene 7.26 (-0.1) 72 1.1.2 + dichorectance 3.56 (+0.2) 353 Einland 6.187 (+0.5) 6.130000 Einland 1.74 (+0.5) 170000 Methane 1.54 (+0.5) 6.130000 Propage 1.66 (+0.6) 1800000 Dichborodificorunchurs (tron 12) 1.78 (+0.4) 17800 1.2.4 dichorotectinosethane (R14) 7.00 (+0.6) 7000000 Choromethane (tron 12) 1.86 (+0.6) 180000 1.3.6 (+0.6) 18000 1.44 (+0.2) 114 Choromethane (tron 11) 2.006 (+0.6) 200000 1.006 (+0.6) 200000 Choromethane (tron 11) 2.006 (+0.6) 618000 2.414 (+0.6) 2.414 (+0.6) 2.1.9 (+0.6) 4.91000 6.18 (+0.6) 618000 2.414 (+0.6) 2.1.9 (+0.6) 4.91000 6.18 (+0.6) 1.900 (+0.6) 1.900 (+0.6) 2.1.9 (+0.6) 4.91000 6.18 (+0.6) 1.900 (+0.6) 1.900 (+0.6) 2.1.9 (+0.6) 4.91000 6.18 (+0.6) 1.900 (+0.6) <td< td=""><td>styrene</td><td>4.60E+03</td><td>4600</td></td<>	styrene	4.60E+03	4600
1.1.2 existence 3.584-02 3.58 Distance 8.134-05 813000 Ringhome 1.748-05 813000 Methane 1.564 to 45.664 gg/m ³ 1.560,000 to 4.560,000 gg/m ³ Propane 1.804-06 180000 Dichorodificoromthum (From 12) 1.784+04 17800 1.2 dichoroschame 1.804+06 180000 1.2 dichoroschame 1.804+08 1800 Vingl Chinele 1.864+06 180000 Understand 2.006+05 200000 Trichkorothame (From 11) 2.006+05 491000 Trichkorothame (From 11) 1.084+08 18000 Trichkorothame (From 11) 1.086+05 6150000 Trichkorothyne 6.184+05 491000 2-Propane (Excercha) 6.184+05 100000 Hold (Edg/Archa) 1.906+03 1000 Li dichborothame 1.006+05 100000 Li dichborothame 1.006+05 100000 Li dichborothame 1.906+03 4000 Li dichborothame 1.906+03 4000 Li dichborothame 1.906+03 4000 Li dichborothame 1.906+03 4000 Li dichborothame 1.906+03 10000 Li dich	1.3.5-trichlorobenzene	7.20E+01	72
Phase 8138-05 813000 Falyene 1.746+05 174000 Falyene 1.746+05 174000 Methane 1.524+60 1.500,000 to 7.500,000 µg/m ³ Propate 1.286+06 1800000 Dechtoridifuormethane (Feor 12) 1.786+06 7000000 L'adductorethane (R14) 7.006+06 7000000 Chloroenthane 1.866+68 1800 Viryl Chbride 1.146+02 114 Chloroenthane 2.006+04 20000 Féhano (Libyl Akoho) 4.918+05 491000 2.Progmano (seconor) 6.186+05 618000 Methyl Fibij Kronce (2.Buanore) 1.006+05 100000 L1-dechtoretyres 4.006+03 4000 ek 1.3.dechtorethane 1.206+04 20000 L1-dechtoretyres 4.006+03 4000 ek 1.3.dechtorethane 1.006+05 100000 L1-dechtoretyres 4.358+061 4.3478 Adutyl Fibij Kronce (2.Buanore) 8.006+02 800 L1-dechtoretyres 3.000 <td>1.1.2-trichloroethane</td> <td>3.58E+02</td> <td>358</td>	1.1.2-trichloroethane	3.58E+02	358
Eñlyane 1.74E+05 174000 Methane 1.5E+6 to -7.6E+6 µg/m ³ 1,500,000 to -7.600,000 µg/m ³ Propane 1.80E+06 1800000 Dichloodifforomenthane (iFron 12) 1.78E+04 174000 1.2 dichlorodifforomenthane (iFron 12) 1.78E+04 17800 1.2 dichlorodifforomenthane (iFron 12) 1.80E+06 180000 Choromethane 2.00E+05 200000 Trichlerofluornestinae (iFron 11) 2.00E+05 200000 Trichlerofluornestinae (iFron 11) 2.00E+05 615000 2 Program (csprograf lackolt) 4.91E+05 615000 2 Program (csprograf lackolt) 6.18E+05 615000 2 Program (csprograf lackolt) 1.00E+05 100000 L4-dichlorodhylene 1.00E+03 4000 L4-dichlorodhylene	Ethane	8.13E+05	813000
Nethanc 1.52+61 to <7.62+6 µg/m ³ 1,500,000 to <7.600,000 µg/m ³ Propane 1.86+66 1800000 Dicibionalitaronmethane (From 12) 1.782+64 178600 1.2 deichorostentanucorthane (R114) 7.000+66 7000000 Chloromethane (From 12) 1.860+68 1800 Viryl Chloride 1.142+62 114 Chloromethane (From 11) 2.000+65 200000 Techborofunzmethane (From 11) 2.000+65 618000 2-fropanol (sogropp) lackhol) 4.91E+05 618000 2-fropanol (sogropp) lackhol) 6.18E+05 618000 2-fropanol (sogropp) lackhol) 1.06E+05 100000 2-fropanol (sogropp) lackhol) 6.18E+05 618000 2-fropanol (sogropp) lackhol) 6.18E+05 618000 2-fropanol (sogropp) lackhol 1.06E+05 100000 1-f.dichorothyme 1.06E+03 10000	Ethylene	1.74E+05	174000
Methane 1.54: feb 2.68: feb gr/m ¹ 1,500.000 to 2,600.000 gr/m ¹ Dirablored Huromethane (Pron 12) 1.881: feb 3 1800: feb 3 1.2. dichinorathane (Pron 12) 7.061: feb 3 700000 1.2. dichinorathane (Pron 12) 1.881: feb 3 1800: feb 3 1.2. dichinorathane (Pron 12) 1.881: feb 3 1800: feb 3 Choromethane (Pron 12) 2.006: feb 3 200000 Choromethane (Pron 11) 2.006: feb 3 200000 Choromethane (Pron 11) 3.000: feb 3 6.00000 Trichhorofularmechane (Pron 11) 6.181: feb 3 6.00000 2.40panne (accore) 6.181: feb 3 6.00000 Adoption (Saperge) alkoho) 1.000: feb 3 100000 2.40panne (accore) 1.000: feb 3 100000 1.1. dichlorothytene 1.000: feb 3 100000 1.1. dichlorothytene 3.000: feb 3 3.00000 1.1. dichlorothytene 3.000: feb 3 3.00000 1.1. dichlorothytene 3.000: feb 3 3.0000 1.1. dichlorothytene 3.000: feb 3 3.0000 1.1. dichlorothytene			
Progame 1.805+06 1800000 Chalchardiffuorenhame (R114) 7.785+064 77000 1.3-Bit-Mode 1.805+06 7000000 Chloromethame (R114) 1.805+06 1.800 Viny (Choride 1.144+02 1.14 Choromethame (Reon II) 2.005+05 200000 Chloromethame (Reon II) 2.005+05 491000 2-Progamol (agroppy) alcoho) 4.915+03 491000 2-Progamol (agroppy) alcoho) 4.915+03 618000 2-Progamol (agroppy) alcoho) 1.005+05 618000 2-Progamol (agroppy) alcoho) 1.005+05 618000 2-Progamol (agroppy) alcoho) 4.915+03 1.900 1-4-dichorobance 1.005+05 1.9000 1-4-dichorobance 1.005+05 1.900 1-4-dichorobance 1.905+06 1.900 1-4-dichorobance 1.905+06 1.900 1-1,1-dichorobance 3.905+02 800 1-1,1-dichorobance 1.905+05 1.9000 1-1,1-dichorobance 1.905+05 1.9000	Methane	1.5E+6 to <7.6E+6 μg/m ³	1,500,000 to <7,600,000 μg/m ³
Dichlorofiluoromethane (Prion 12) 1.788-04 17800 2.000-066 7000000 Chloromethane 1.808-08 1800 Yinyl Chloride 1.148-02 1.14 Chloromethane 2.000-05 2.00000 Tichkorofuluromethane (Fron 11) 2.000-06 6.188-00 Exhanol (Enfly Alcohoh) 1.905-06 6.188-00 2-Propanon (coronyl Alcohoh) 4.918-05 401000 2-Propanon (coronyl Alcohoh) 1.005-05 100000 Alchohorethane 1.905-03 40000 2-Propanon (coronyl Alcohoh) 4.006-03 4000 1.1-dichorethylene 4.006-03 4000 eis J.2-dichorethylene 4.305-04 43478 Chloroform 4.356-04 43478 Chloroform 5.005-02 500 1.1-1-trichorenchane 2.005-04 20000 1.1-1-trichorenchane 3.038-02 303 Chloroform 5.056-02 303 I.1.1-trichorenchane 3.038-02 303 Dichoroform 5.056-04	Propane	1.80E+06	1800000
1.2.dr.httoretr.fluorethane (k114) 7.000:+06 7000000 Vinyl Chorde 1.148:+02 114 Chlorotethane 2.006:+06 200000 Trihdhordthormethane (Fron 11) 2.006:+06 618000 Trihdhordthormethane (Fron 11) 2.006:+06 618000 2-Propanol (scroppyl alcohol) 4.91:E405 491000 2-Propanol (scroppyl alcohol) 6.18E:+05 618000 2-Propanol (scroppyl alcohol) 1.00E:+03 100000 1.4-dichlorothylene 1.00E:+03 100000 1.4-dichlorothylene 4.000 5.66:+02 5.66 1.1.1-itchlorothylene 5.06:+02 5.60 5.60 1.1.1-itchlorothylene 5.06:+02 5.00 5.00 1.1.1-itchlorothylene 5.06:+02 5.00 5.00 1.1.1-itchlorothylene 5.06:+02 5.00 5.00 1.1.1-itchlorothylene 5.06:+04 5.00 5.00 1.1.1-itchlorothylene 5.06:+04 5.000 5.00 1.1.1-itchlorothylene 5.06:+04 5.000 5.00	Dichlorodifluoromethane (Freon 12)	1.78E+04	17800
Choromethane 1.80E+08 1800 Vinja Chloride 1.144E+02 1144 Chorosthune 2.00E+05 200000 Trichlorofthomethane (Freen 1) 2.00E+064 20000 Extended Listly Locholi 1.90E+066 6.18800 2-Propanone (costrop) 6.5.8E+05 6.168000 2-Propanone (costrop) 6.5.8E+05 1000000 1.4_d-thhorobrownerbane 1.00E+05 100000 1.4_d-thhorobrownerbane 1.00E+03 4000 1.4_d-thhorobrownerbane 1.00E+03 4000 1.1_d-thhorobrownerbane 1.00E+03 4000 1.1_d-thhorobrownerbane 3.05E+04 43478 1.1_d-thhorobrownerbane 2.00E+04 20000 1.1_d-thhorobrownerbane 2.00E+04 20000 trichkorosthylene (updated) 8.00E+02 800 tetrachborosthylene (updated) 8.00E+02 800 tetrachborosthylene (updated) 5.05E+04 505512 1.1_d-trichtorosthune 1.00E+04 50000 1.1_d-trichtorosthome 1.00E+04 50000	1,2-dichlorotetrafluorethane (R114)	7.00E+06	700000
Vinyl Chorda 1.14E+02 114 Cklorosthane 2.00E+05 200000 Trichlorofhormehnare (Freen II) 2.00E+04 20000 Ebhanol (Ely)l Akoho) 4.91E+05 491000 2-Propanot (scorope) alcoho) 6.31E+05 618000 2-Propanot (scorope) 6.31E+05 618000 2-Propanot (scorope) 1.00E+05 100000 1.4-dichlorothylene (2-Buanone) 1.00E+05 100000 1.4-dichlorothylene 1.99E+03 4000 ci.2_dichlorothylene 1.97E+02 1.79 methylene (bindic (dichloromethane) 4.00E+03 6000 1.1_1-trichlorothylene 5.06E+02 560 1.1_1-trichlorothylene 8.00E+02 800 trichlorothylene (updated) 8.00E+02 800 trichlorothylene 1.90E+05 190000 PHC F1 5.95E+04 59552 1.0E 5.90E+04 50000 CF1 2.78E+04 27778 CF2 2.78E+04 50000 Aliphate C12-C12 5.00E+04	Chloromethane	1.80E+08	1800
Chlorochane 2.00E+04 200000 Enhanol (Edy) Alcohol) 1.90E+06 618000 2-Propamos (escropy) alcohol) 4.91E+05 491000 2-Propamos (escropy) alcohol) 6.18E+05 618000 Methy Eduy Ketone (2-Butanone) 1.00E+045 1000000 1.1-d-chlorobernazane 1.90E+03 1900 1.1-d-chlorobernazane 1.90E+03 4000 cis.1_2-d-chloroberdiylene 4.30E+03 4000 cis.1_2-d-chloroberdiylene 4.35E+04 43278 chloroforan 5.60E+02 5.60 1.1.1-trichloroethylene 2.00E+04 20000 chloroothylene 8.00E+02 800 berazene 3.03E+02 800 berazene 3.03E+02 800 perazene 3.03E+02 800 perazene 3.03E+02 800 perazene 3.03E+02 800 perazene 3.02E+04 59532 perazene 3.02E+04 59500 perazene 3.00E+04 50000 <t< td=""><td>Vinyl Chloride</td><td>1.14E+02</td><td>114</td></t<>	Vinyl Chloride	1.14E+02	114
Trichlorofbuomethane (Freen 1) 2.00E+06 6.18000 2.Propanol (sepropyl alcohol) 4.91E+05 6.18000 2.Propanol (secone) 6.18E+05 6.18000 2.Propanol (secone) 1.00E+05 1.00000 1.4-dichlorobenzene 1.00E+05 1.00000 1.4-dichlorobenzene 4.00E+03 4000 1.1dichlorobenzene 4.35E+04 43478 -dichlorobenzene 1.79E+02 179 methyleen chloride (dichloromethane) 4.35E+04 43478 -dichlorobenzene 2.00E+04 20000 1.1.1-dichlorobenzene 5.66E+02 560 1.1.1-dichlorobenzene 3.03E+02 800 1.1.1-dichlorobenzene 3.03E+02 800 benzene 3.03E+02 303 benzene 3.03E+04 50500 CPI Aliphatic G+CS 9.20000 20000 <td>Chloroethane</td> <td>2.00E+05</td> <td>200000</td>	Chloroethane	2.00E+05	200000
Ethanol (Ethyl Akcohol) 1.306+06 618000 2-Propanol (soperoyl alcohol) 4.916+05 4911000 2-Propanol (soperoyl alcohol) 1.006+05 100000 4.4dchlorobenytone 1.006+03 100000 1.1-dchlorobenytone 4.006+03 4000 1.1-dchlorobenytone 1.795+02 179 methylene chloride (dichloromethane) 4.355+04 43478 chlorobenytone 5.606+02 560 1.1-trichlorobethylene 5.606+02 800 tertaxhlorobethylene (updated) 8.006+02 800 tertaxhlorobethylene 1.306+03 190000 tertaxhlorobethylene 1.306+04 20000 tertaxhlorobethylene 8.006+02 800 berazne 3.038+02 800 berazne 1.906+05 190000 tertaxhlorobethylene (updated) 8.006+02 800 berazne 1.906+05 190000 tertaxhlorobethylene (updated) 8.006+02 800 berazne 1.906+04 59552 Chlorobethy	Trichlorofluormethane (Freon 11)	2.00E+04	20000
2-Propanoi (soprop) alcoha) 4.911405 491000 2-Propanoi (socrop) 6.181405 618000 Methyl Ethyl Ketone (2-Butanone) 1.006403 1900 1.4-dichlorobenzene 1.006403 40000 1.4-dichlorobenzene 1.796702 179 methylene chloride (dichloromethane) 4.356404 43478 Adloroform 5.606402 560 1.1,1-trichlorobylene 8.006402 800 tickhoroschylene 8.006402 800 tickhoroschylene 3.038402 800 tickhoroschylene 3.038402 800 tickhoroschylene 3.038402 303 tickhoroschylene 3.038402 303 tickhoroschylene 3.038402 303 tickhoroschylene 9.206405 920000 PHC FI 5.958404 59532 Malphatic CC-C10 1.006404 100000 PHC F2 Aliphatic C10-C12 5.006404 50000 Aliphatic C12-C16 5.006404 50000 1.01641 tota	Ethanol (Ethyl Alcohol)	1.90E+06	618000
2-Propanore (acctome) 6.184:05 618000 2-Propanore (acctome) 1.00E+05 1000000 1.4-dichlorobenzene 1.90E+03 1900 1.1-dichlorobenzene 1.90E+03 4000 cis.1-2-dichlorobenzene 1.79E+02 1.73 methylene chloride (dichloromethane) 4.35E+04 43478 chloroform 5.60E+02 560 1.1-1 trichloroethane 2.00E+04 20000 trichloroethylene 8.00E+02 800 benzene 3.03E+02 303 trichloroethylene 1.90E+05 190000 benzene 3.03E+02 303 toluene 1.90E+05 190000 PIC F1 5.95E+04 59552 Carter Aliphatic C8-C10 5.00E+04 50000 Aliphatic C8-C10 5.00E+04 50000 Carter Aliphatic C12-C16 5.00E+04 50000 Carter Aliphatic C12-C16 5.00E+04 50000 Carter Aliphatic C12-C16 5.00E+04 50000 Caromatic C12-C16 5.00E+04	2-Propanol (isopropyl alcohol)	4.91E+05	491000
Methyl Edryl Ketore (2-Sutanone) 1.00E+05 100000 1.4-dichorochrylene 4.00E+03 4000 cis.1_4-dichorochrylene 1.79E+02 179 methylene (holoromethane) 4.33E+04 43478 chlorochrylene 5.60E+02 560 1,1,1-trichlorochrane 2.00E+04 20000 trichlorochrylene (updated) 8.00E+02 800 benzene 3.03E+02 303 tolknorochrylene (updated) 8.00E+02 800 benzene 3.03E+02 303 tolknorochrylene (updated) 8.00E+02 800 benzene 3.03E+02 303 tolknorochrylene (updated) 8.00E+04 59532 Chlorochrom 1.90E+05 920000 Aliphatic C6-C8 9.20E+05 920000 Aliphatic C10-C12 5.00E+04 50000 Chlorochrom 1.00E+04 10000 PHC F2 2.78E+04 50000 Aromatic C10-C12 5.00E+04 50000 Aliphatic C2-C16 5.00E+04 50000 </td <td>2-Propanone (acetone)</td> <td>6.18E+05</td> <td>618000</td>	2-Propanone (acetone)	6.18E+05	618000
1.4-dichlorobenzene 1.90-14 1.4-dichlorobenzene 1.79E+02 179 nethylene chloride (dichloromethane) 4.35E+04 43478 chloroform 5.60E+02 560 1.1-1richloroethylene 2.00E+04 20000 1.1-1richloroethylene (updated) 8.00E+02 800 benzene 3.03E+02 303 totuene 1.90E+05 190000 benzene 3.03E+02 303 totuene 1.90E+05 190000 PHC F1 5.95E+04 59532 Columna Aliphatic C6-C8 9.20E+05 920000 PHC F2 2.78E+04 27778 Columna Aliphatic C10-C12 5.00E+04 50000 PHC F2 2.00E+04 50000 50000 Aliphatic C10-C12 5.00E+04 50000 500E+04	Methyl Ethyl Ketone (2-Butanone)	1.00E+05	100000
1.1.definited 4.00-403 4000 1.1.94-000 4.000 4000 cis-1.2-dichloroethylene 1.795+02 1.79 methylene chloride (dichloromethane) 4.355+04 43478 chloroform 5.60 1.1.1 1.1.1-trichloroethane 2.006+04 20000 trichloroethylene (updated) 8.005+02 800 tetrachloroethylene 8.005+02 800 benzene 3.035+02 303 toluene 1.905+05 1900000 PHC F1 5.955+04 59532 Call Collector 3.000+04 50000 Aliphatic C6-C8 9.205+05 920000 Aliphatic C8-C10 5.005+04 50000 Call Collector 3.000+04 10000 PHC F2 2.788+04 2.7778 Call Coll Coll Coll 3.000+04 10000 Aliphatic C10-C12 5.000+04 50000 Call Aliphatic C10-C12 1.000+04 10000 Call Coll Coll Coll Coll Coll Coll Coll	1,4-dichlorobenzene	1.90E+03	1900
CS-1_2-dichoroeftyiene 1.79 methylene chloroeftyiene 4.35E+04 43378 chloroform 5.60E+02 560 1,1,1-trichoroeftyne 8.00E+02 800 tetrachloroeftyne (updated) 8.00E+02 800 tetrachloroeftylene 8.00E+02 800 bezzene 3.03E+02 303 tolkene 1.99E+05 190000 PHC FI 5.95E+04 59532 CA Aliphatic C6-C8 9.20E+05 920000 Aliphatic C8-C10 5.00E+04 50000 PHC F2 2.78E+04 27778 CA Aliphatic C10-C12 5.00E+04 50000 PHC F2 2.78E+04 27778 CA Aliphatic C10-C12 5.00E+04 50000 Aromatic C10-C12 1.00E+04 10000 10000 Aromatic C10-C12 5.00E+04 50000 1.3,5trinethylbenzene 9.00E+03 9000 total xylenes 9.00E+03 9000 1.3,5trinethylbenzene 4.00E+02 400	1,1,-dichlorethylene	4.00E+03	4000
Main product (activation of the activation	cis-1,2-dichloroethylene	1.79E+02	179
Chilofordin 3.00 1,1-trichloroethane 2.00E+02 800 trichloroethylene (updated) 8.00E+02 800 tetrachloroethylene 8.00E+02 800 benzene 3.03E+02 303 toluene 1.90E+05 190000 PHC F1 5.95E+04 595532 Aliphatic C6-C8 9.20E+05 920000 Aliphatic C8-C10 5.00E+04 50000 PHC F2 2.78E+04 27778 Aliphatic C10-C12 5.00E+04 50000 Aliphatic C10-C12 5.00E+04 50000 Aromatic C10-C12 5.00E+04 50000 Aliphatic C10-C12 5.00E+04 50000 Aromatic C12-C16 5.00E+04 10000 Aromatic C12-C16 5.00E+04 10000 Aromatic C12-C16 1.00E+04 10000 L3.5-trimethylbenzene 4.00E+02 400 L3.4-trimethylbenzene 4.00E+02 400 L3.4-trimethylbenzene 1.02E+04 140000 hetane 1.0	ehleroform	4.35E+04	43478
1.1.1 minihoomina 2.001*00 2000 1.1.1 minihoomina 2.001*00 800 tetrachloroethylene 8.00E+02 800 benzene 3.03E+02 800 toluene 1.90E+05 190000 PHC F1 5.95E+04 59532 Aliphatic C6-C8 9.20E+05 920000 Aliphatic C8-C10 1.00E+04 10000 PHC F2 2.78E+04 27778 C1 Aliphatic C12-C16 5.00E+04 50000 PHC F2 2.78E+04 27778 C1 Aliphatic C12-C16 5.00E+04 50000 Aliphatic C12-C16 5.00E+04 50000 Aliphatic C12-C16 5.00E+04 50000 Aliphatic C12-C16 1.00E+04 10000 Aliphatic C12-C16 1.00E+04 10000 Aliphatic C12-C16 1.00E+04 10000 Aliphatic C12-C16 1.00E+04 10000 1.3_4-minethylbenzene 9.00E+03 9000 1.3_5-trimethylbenzene 4.00E+02 400 1.3_5-trimethylbenzene 1.40E+04 14000 heytane 8.00E+03 8000 cyclohexane 1.20E+05 120000 tetrahydrofaran 6.02E+04 64173 c		2 005+04	20000
Internotion/text equatory 0.0000 benzene 8.0000 benzene 3.032402 303 toluene 1.905405 190000 PHC F1 5.955404 59532 Caller Ce-CR 9.20000 920000 Aliphatic C6-CR 9.20040 50000 Aliphatic C8-C10 5.000404 50000 Aromatic C8-C10 1.000404 10000 PHC F2 2.78E404 27778 Calliphatic C10-C12 5.00E404 50000 Aliphatic C10-C12 5.00E404 50000 Aliphatic C10-C12 5.00E404 50000 Aliphatic C12-C16 5.00E404 50000 Aliphatic C12-C16 5.00E404 10000 Aromatic C10-C12 1.00E404 10000 total xylenes 9.00E403 9000 1,3.5-trimethylbenzene 4.00E402 400 hexane 1.400E404 140000 hexane 1.40E404 14000 hexane 6.00E403 8000 <td< td=""><td>trichloroethylene (undated)</td><td>8 00E+02</td><td>800</td></td<>	trichloroethylene (undated)	8 00E+02	800
Construction Construction Construction bolice 3.03E+02 3.03 toluene 1.90E+05 190000 PHC F1 5.95E+04 59532 Aliphatic C6-C8 9.20E+05 920000 Aliphatic C8-C10 5.00E+04 50000 Aliphatic C8-C10 5.00E+04 50000 PHC F2 2.78E+04 27778 Aliphatic C12-C16 5.00E+04 50000 Aliphatic C12-C16 5.00E+04 50000 Aliphatic C12-C16 5.00E+04 50000 Aliphatic C12-C16 5.00E+04 50000 Aliphatic C12-C16 5.00E+04 10000 Aromatic C10-C12 1.00E+04 10000 Aromatic C12-C16 1.00E+04 10000 ethylbenzene 9.00E+03 9000 1.3.5-trimethylbenzene 4.00E+02 400 1.2.4-trimethylbenzene 1.40E+04 14000 hexane 1.40E+04 14000 heptane 8.00E+03 8000 cyclohexane	tetrachloroethylene	8.00E+02	800
Banking Book Diluene 1.90E+05 190000 PHC F1 5.95E+04 59532 Aliphatic C8-C10 5.00E+04 50000 Aliphatic C8-C10 5.00E+04 50000 PHC F2 2.78E+04 27778 Aliphatic C10-C12 5.00E+04 50000 PHC F2 2.78E+04 27778 Aliphatic C10-C12 5.00E+04 50000 Aliphatic C10-C12 5.00E+04 50000 Aliphatic C10-C12 5.00E+04 50000 Aromatic C10-C12 1.00E+04 10000 Aromatic C10-C12 1.00E+04 10000 ethylbenzene 5.00E+04 50000 total xylenes 9.00E+03 9000 1.3,5+rimethylbenzene 4.00E+02 400 hexane 1.40E+04 14000 heptane 8.00E+03 8000 cyclockane 1.20E+05 120000 tetrahydrofuran 4.00E+04 40000 propene 6.00E+04 60000	benzene	3.03F+02	303
PHC F1 5.95E+04 59532 Aliphatic C6-C8 9.20E+05 920000 Aliphatic C8-C10 5.00E+04 50000 Aliphatic C8-C10 1.00E+04 10000 PHC F2 2.78E+04 27778 Aliphatic C10-C12 5.00E+04 50000 Aliphatic C10-C12 5.00E+04 50000 Aliphatic C10-C12 5.00E+04 50000 Aliphatic C10-C12 5.00E+04 50000 Aliphatic C10-C12 1.00E+04 100000 Aromatic C10-C12 1.00E+04 100000 ethylbenzene 5.00E+04 50000 total xylenes 9.00E+03 9000 1.3.5-timethylbenzene 4.00E+02 400 hexane 1.40E+04 14000 hexane 1.20E+05 120000 tetrahydrofuran 4.00E+04 60000 2.2.4-trimethylpentane 6.00E+04 600000 2.2.4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	toluene	1.90E+05	190000
Aliphatic C6-C8 9.20E+05 920000 Aliphatic C8-C10 5.00E+04 50000 Aromatic C8-C10 1.00E+04 10000 PHC F2 2.78E+04 27778 Aliphatic C10-C12 5.00E+04 50000 Aliphatic C12-C16 5.00E+04 50000 Aliphatic C12-C16 5.00E+04 50000 Aromatic C10-C12 1.00E+04 10000 Aromatic C12-C16 1.00E+04 10000 ethylbenzene 5.00E+04 50000 total xylenes 9.00E+03 90001 1.3.5-trimethylbenzene 4.00E+02 400 1.3.5-trimethylbenzene 4.00E+02 400 hexane 1.40E+04 14000 hexane 1.20E+05 120000 tetrahydrofuran 4.00E+04 40000 propene 6.00E+04 60000 2.2.4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	PHC F1	5.95E+04	59532
Aliphatic C8-C10 5.00E+04 50000 Aromatic C8-C10 1.00E+04 10000 PHC F2 2.78E+04 27778 Aliphatic C10-C12 5.00E+04 50000 Aliphatic C12-C16 5.00E+04 50000 Aliphatic C12-C16 5.00E+04 50000 Aromatic C10-C12 1.00E+04 10000 Aromatic C12-C16 1.00E+04 10000 ethylbenzene 5.00E+04 50000 total xylenes 9.00E+03 9000 1,3,5-trimethylbenzene 4.00E+02 400 1,2,4-trimethylbenzene 4.00E+02 400 hexane 1.40E+04 14000 heptane 8.00E+03 8000 cyclohexane 1.20E+05 120000 tetrahydrofuran 4.00E+04 40000 propene 6.00E+04 60000 2,2,4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	Aliphatic C6-C8	9.20E+05	920000
Aromatic C8-C10 1.00E+04 10000 PHC F2 2.78E+04 27778 Aliphatic C10-C12 5.00E+04 50000 Aliphatic C12-C16 5.00E+04 50000 Aliphatic C12-C16 5.00E+04 50000 Aromatic C10-C12 1.00E+04 10000 Aromatic C12-C16 1.00E+04 10000 ethylbenzene 5.00E+04 50000 total xylenes 9.00E+03 9000 1,3,5-trimethylbenzene 4.00E+02 400 1,2,4-trimethylbenzene 4.00E+02 400 hexane 1.40E+04 14000 heytane 1.20E+05 120000 tetrahydrofuran 4.00E+03 8000 cyclohexane 1.20E+05 120000 tetrahydrofuran 6.00E+04 60000 z,2,4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	Aliphatic C8-C10	5.00E+04	50000
PHC F2 2.78E+04 27778 Aliphatic C10-C12 5.00E+04 50000 Aliphatic C12-C16 5.00E+04 50000 Aromatic C10-C12 1.00E+04 10000 Aromatic C12-C16 1.00E+04 10000 ethylbenzene 5.00E+04 50000 total xylenes 9.00E+03 9000 1,3,5-trimethylbenzene 4.00E+02 400 hexane 1.40E+04 14000 heptane 8.00E+03 8000 cyclohexane 1.20E+05 120000 tetrahydrofuran 4.00E+04 60000 propene 6.00E+04 60000 2,2-4-trimethylpentane 6.02E+04 64173 carbon disulfide 2.00E+03 2000	Aromatic C8-C10	1.00E+04	10000
Aliphatic C10-C12 5.00E+04 50000 Aliphatic C12-C16 5.00E+04 50000 Aromatic C10-C12 1.00E+04 10000 Aromatic C12-C16 1.00E+04 10000 ethylbenzene 5.00E+04 50000 total xylenes 9.00E+03 9000 1,3,5-trimethylbenzene 4.00E+02 400 1,2,4-trimethylbenzene 4.00E+02 400 hexane 1.40E+04 14000 keylonexane 1.20E+05 120000 cyclohexane 1.20E+05 120000 tetrahydrofuran 6.00E+04 60000 propene 6.00E+04 60000 2,2,4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	PHC F2	2.78E+04	27778
Aliphatic C12-C16 5.00E+04 50000 Aromatic C10-C12 1.00E+04 10000 Aromatic C12-C16 1.00E+04 10000 ethylbenzene 5.00E+04 50000 total xylenes 9.00E+03 9000 1,3,5-trimethylbenzene 4.00E+02 400 1,2,4-trimethylbenzene 4.00E+02 400 hexane 1.40E+04 14000 heytane 8.00E+03 8000 cyclohexane 1.20E+05 120000 tetrahydrofuran 4.00E+04 40000 propene 6.00E+04 60000 2,2,4-trimethylpentane 6.02E+04 64173 carbon disulfide 2.00E+03 2000	Aliphatic C10-C12	5.00E+04	50000
Aromatic C10-C12 1.00E+04 10000 Aromatic C12-C16 1.00E+04 10000 ethylbenzene 5.00E+04 50000 total xylenes 9.00E+03 9000 1,3,5-trimethylbenzene 4.00E+02 400 1,2,4-trimethylbenzene 4.00E+02 400 hexane 1.40E+04 14000 heytane 8.00E+03 8000 cyclohexane 1.20E+05 120000 tetrahydrofuran 4.00E+04 40000 propene 6.00E+04 60000 2,2,4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	Aliphatic C12-C16	5.00E+04	50000
Aromatic C12-C16 1.00E+04 10000 ethylbenzene 5.00E+04 50000 total xylenes 9.00E+03 9000 1,3,5-trimethylbenzene 4.00E+02 400 1,2,4-trimethylbenzene 4.00E+02 400 hexane 1.40E+04 14000 heptane 8.00E+03 8000 cyclohexane 1.20E+05 120000 tetrahydrofuran 4.00E+04 40000 propene 6.00E+04 60000 2,2,4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	Aromatic C10-C12	1.00E+04	10000
ethylbenzene 5.00E+04 50000 total xylenes 9.00E+03 9000 1,3,5-trimethylbenzene 4.00E+02 400 1,2,4-trimethylbenzene 4.00E+02 400 hexane 1.40E+04 14000 heptane 8.00E+03 8000 cyclohexane 1.20E+05 120000 tetrahydrofuran 4.00E+04 40000 propene 6.00E+04 60000 2,2,4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	Aromatic C12-C16	1.00E+04	10000
total xylenes 9.00E+03 9000 1,3,5-trimethylbenzene 4.00E+02 400 1,2,4-trimethylbenzene 4.00E+02 400 hexane 1.40E+04 14000 heptane 8.00E+03 8000 cyclohexane 1.20E+05 120000 tetrahydrofuran 4.00E+04 40000 propene 6.00E+04 60000 2,2,4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	ethylbenzene	5.00E+04	50000
1,3,5-trimethylbenzene 4.00E+02 400 1,2,4-trimethylbenzene 4.00E+02 400 hexane 1.40E+04 14000 heptane 8.00E+03 8000 cyclohexane 1.20E+05 120000 tetrahydrofuran 4.00E+04 40000 propene 6.00E+04 60000 2,2,4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	total xylenes	9.00E+03	9000
1,2,4-trimethylbenzene 4.00E+02 400 hexane 1.40E+04 14000 heptane 8.00E+03 8000 cyclohexane 1.20E+05 120000 tetrahydrofuran 4.00E+04 40000 propene 6.00E+04 60000 2,2,4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	1,3,5-trimethylbenzene	4.00E+02	400
hexane 1.40E+04 14000 heptane 8.00E+03 8000 cyclohexane 1.20E+05 120000 tetrahydrofuran 4.00E+04 40000 propene 6.00E+04 60000 2,2,4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	1,2,4-trimethylbenzene	4.00E+02	400
heptane 8.00E+03 8000 cyclohexane 1.20E+05 120000 tetrahydrofuran 4.00E+04 40000 propene 6.00E+04 60000 2,2,4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	hexane	1.40E+04	14000
cyclohexane 1.20E+05 120000 tetrahydrofuran 4.00E+04 40000 propene 6.00E+04 60000 2,2,4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	heptane	8.00E+03	8000
tetrahydrofuran 4.00E+04 40000 propene 6.00E+04 60000 2,2,4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	cyclohexane	1.20E+05	120000
propene 6.00E+04 60000 2,2,4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	tetrahydrofuran	4.00E+04	40000
2,2,4-trimethylpentane 6.42E+04 64173 carbon disulfide 2.00E+03 2000	propene	6.00E+04	60000
carbon disulfide 2.00E+03 2000	2,2,4-trimethylpentane	6.42E+04	64173
Notes	carbon disulfide	2.00E+03	2000
	Notes		

2. Ethane, Ethylene, Ethanol, 2-Propanol, Propane, 1,2-dichlorotetrafluorethane (R114), and 2,2,4-trimethylpentane criteria adopted from Occupational Exposure Limits (PEL), assume no dilution/attenuation

1. Methane screening will be completed in accordance with Table 6, Draft Soil and Building Methane Gas Management Guide, Oct 2013, (Alberta Health Services)

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Table A4 Summary of Analytical Results for Fixed Gases and Petroleum Hydrocarbons in Soil Vapour

									Soil Vapo	our Probes						
Sample ID			VW-01	VW-03	VW	/-05	XCG- 1(SVP)	XCG- 2(SVP)	XCG- 4(SVP)	XCG- 5(SVP)	XCG- 6(SVP)	XCG- 9(SVP)	XCG- 10(SVP)	XCG- 12(SVP)	XCG- 13(SVP)	Trip Blank
Laboratory	Units	Reportable Detection Limit	Maxxam	Maxxam	Max	xam	Maxxam	Maxxam	Maxxam	Maxxam						
Canister number			332	1280	1800	3017	1470	243	1281	1380	238	333	354	262	354	215
Laboratory ID			EBG095	EBG097	EBG090	EBG091	EBG092	EBG089	EBG086	EBG085	EBG088	EBG096	EBG094	EBG087	EBG093	EBG098
Date Sampled	-		12-Mar-17	12-Mar-17	11-Mar-17	11-Mar-17	11-Mar-17	11-Mar-17	14-Mar-17	14-Mar-17	13-Mar-17	11-Mar-17	12-Mar-17	14-Mar-17	12-Mar-17	N/A
Summa Canister Pressure on Receipt (psig)		NV	(-2.9)	(-3.1)	(-1.9)	(-2.0)	(-1.7)	(-3.6)	(-3.4)	(-3.4)	(-3.0)	(-2.7)	(-1.1)	(-3.0)	(-1.7)	(-14.3)
Oxygen	(% v/v)	0.2-0.3	23.0	12.5	8.6	9.6	20.4	20.3	2.0	20.3	1.9	21.3	15.8	18.7	4.3	
Nitrogen	(% v/v)	0.2-0.3	77.0	80.7	79.0	78.9	78.1	78.4	82.8	77.4	81.5	78.2	81.7	79.0	84.8	
Carbon Monoxide	(% v/v)	0.2-0.3	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2	< 0.3	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Methane	(% v/v)	0.2-0.3	< 0.2	< 0.2	0.3	0.3	< 0.2	< 0.3	5.7	< 0.3	1.2	< 0.2	< 0.2	< 0.2	1.1	
Carbon Dioxide	(% v/v)	0.2-0.3	< 0.2	6.8	12.1	11.3	1.5	1.3	9.5	2.3	15.4	0.6	2.5	2.3	9.8	
Ethane	ppm	0.17-0.27	< 0.21	< 0.19	2.3	2.1	< 0.2	< 0.27	0.24	< 0.26	< 0.22	< 0.21	< 0.17	< 0.23	< 0.19	
Ethylene	ppm	0.17-0.27	< 0.21	< 0.19	6.8	6.3	< 0.2	< 0.27	6.2	< 0.26	0.57	< 0.21	< 0.17	< 0.23	0.25	
Propane	ppm	0.17-0.27	< 0.21	< 0.19	< 0.21	< 0.2	< 0.2	< 0.27	< 0.23	< 0.26	< 0.22	< 0.21	< 0.17	< 0.23	< 0.19	
Propene	ppm	0.17-0.27	< 0.21	< 0.19	< 0.21	< 0.2	< 0.2	< 0.27	< 0.23	< 0.26	< 0.22	< 0.21	< 0.17	< 0.23	< 0.19	
F1-BTEX, C6-C10 (as Toluene)	$\mu g/m^3$	5.0	7.9	31.8	486	530	36.1	<5.0	39.7	18.4	668	6.0	43.0	8.8	5830	<5.0
F2, C10-C16 (as Decane)	$\mu g/m^3$	5.0	12.7	<5.0	62.8	68.9	<5.0	<5.0	<5.0	6.2	<5.0	<5.0	<5.0	<5.0	972	<5.0
Notes:	-															
<	Not Analyzed Below Laboratory MDL															

Table A5 Summary of Analytical Results for VOCs in Soil Vapour

									Soil Vapo	ur Probes						
Sample ID			VW-01	VW-03	vw	/-05	XCG-1(SVP)	XCG-2(SVP)	XCG-4(SVP)	XCG-5(SVP)	XCG-6(SVP)	XCG-9(SVP)	XCG-10(SVP)	XCG-12(SVP)	XCG-13(SVP)	Trip Blank
Laboratory	Units	Reportable Detection Limit	Maxxam	Maxxam	Max	xam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam
Canister number		Detection Linit	332	1280	1800	3017	1470	243	1281	1380	238	333	354	262	354	215
Laboratory ID			EBG095	EBG097	EBG090	EBG091	EBG092	EBG089	EBG086	EBG085	EBG088	EBG096	EBG094	EBG087	EBG093	EBG098
Date Sampled			12-Mar-17	12-Mar-17	11-Mar-17	11-Mar-17	11-Mar-17	11-Mar-17	14-Mar-17	14-Mar-17	13-Mar-17	11-Mar-17	12-Mar-17	14-Mar-17	12-Mar-17	N/A
Dichlorodifluoromethane (FREON 12)	µg/m'	0.989 - 9.89	2.50	571	867	855	8.46	2.68	41.3	280	88.9	2.46	3.67	89.5	2950	< 0.989
1,2-Dichlorotetrafluoroethane	µg/m³	1.19 - 4.75	<1.19	1790	516	512	<1.19	<1.19	44.4	<1.19	341	<1.19	4.91	<1.19	565	<1.19
Chloromethane Vinyl Chloride	µg/m°	0.62	4.39	<0.620	<0.620	<0.620	<0.620	<0.620	<0.620	<0.620	<0.620	<0.620	<0.30	<0.620	<0.620	<0.620
Chloroethane	μg/m ²	0.230 - 1.28	<0.230	<0.792	23.2	23.1	<0.792	<0.230	<0.792	<0.792	0.978	<0.230	<0.30	<0.230	4.36	<0.230
1,3-Butadiene	μg/m [°]	1.11	<1.11	<1.11	<1.11	<1.11	<1.11	<1.11	<1.11	<1.11	<1.11	<1.11	< 0.50	<1.11	<1.11	<1.11
Trichlorofluoromethane (FREON 11)	μg/m ³	0.12	1.21	<1.12	5.92	5.85	<1.12	<1.12	<1.12	1.31	<1.12	<1.12	<0.20	<1.12	<1.12	<1.12
Trichlorotrifluoroethane	μg/m ug/m ³	1.88	21.1	<1.88	<1.15	81./ <1.15	<1.88	<1.88	180	2.74	<1.88	<1.88	<0.15	<1.88	<1.88	<1.88
2-propanol	µg/m°	2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<1.0	<2.46	<2.46	<2.46
2-Propanone	µg/m²	1.90 - 47.5	11.1	<1.90	4.33	4.45	<1.90	<1.90	<21.1	3.29	5.48	<1.90	< 0.80	<1.90	<47.5	<1.90
Methyl Ethyl Ketone (2-Butanone) Methyl Isobutyl Ketone	μg/m ³	2.95 - 6.19	<2.95	<2.95	<2.95	<2.95	<2.95	<2.95	<2.95	<2.95	<6.19	<2.95	<1.0	<2.95	<3.24	<2.95
Methyl Butyl Ketone (2-Hexanone)	μg/m ³	4.1	<4.10	<4.10	<4.10	<4.10	<4.10	<4.10	<4.10	<4.10	<4.10	<4.10	<1.0	<4.10	<4.10	<4.10
Methyl t-butyl ether (MTBE)	µg/m ³	0.721	< 0.721	< 0.721	< 0.721	< 0.721	< 0.721	< 0.721	< 0.721	< 0.721	<0.721	<0.721	< 0.20	< 0.721	< 0.721	<0.721
Ethyl Acetate	μg/m ³	3.6	<3.60	<3.60	<3.60	<3.60	<3.60	<3.60	<3.60	<3.60	<3.60	<3.60	<1.0	<3.60	<3.60	<3.60
cis-1.2-Dichloroethylene	μg/m ug/m ²	0.396	<0.396	<0.396	<0.396	<0.396	<0.396	<0.396	<0.396	<0.396	<0.396	<0.396	<0.10	<0.396	5.72	<0.396
trans-1,2-Dichloroethylene	μg/m°	0.396	<0.396	<0.396	5.07	5.05	<0.396	<0.396	<0.396	<0.396	1.60	<0.396	<0.10	<0.396	5.49	<0.396
Methylene Chloride(Dichloromethane)	μg/m ³	2.78	<2.78	<2.78	<2.78	<2.78	<2.78	<2.78	<2.78	<2.78	<2.78	<2.78	< 0.80	<2.78	<2.78	<2.78
Chioroiorm Carbon Tetrachloride	μg/m ³	0.488	1.40	21.2	<0.488	<0.488	0.734	3.24	0.523	<0.488	<0.488	10.5	3.03	0.793	1.32	<0.488
1,1-Dichloroethane	μg/m ²	0.405 - 1.21	<0.405	0.522	<1.21	<1.21	<0.405	<0.405	<0.405	<0.405	<0.405	<0.405	<0.10	<0.405	1.74	<0.405
1,2-Dichloroethane	µg/m²	0.405	< 0.405	< 0.405	< 0.405	< 0.405	< 0.405	< 0.405	< 0.405	< 0.405	< 0.405	< 0.405	< 0.10	< 0.405	< 0.405	< 0.405
Ethylene Dibromide	μg/m ³	0.768	<0.768	<0.768	<0.768	<0.768	<0.768	<0.768	<0.768	<0.768	<0.768	<0.768	<0.10	<0.768	<0.768	<0.768
1,1,2-Trichloroethane	μg/m ³	0.546	<0.546	<0.546	<0.546	<0.546	<0.546	<0.546	<0.546	<0.546	<0.546	<0.546	<0.10	<0.546	<0.546	<0.546
1,1,2,2-Tetrachloroethane	µg/m³	0.687	< 0.687	<0.687	<0.687	<0.687	< 0.687	< 0.687	< 0.687	< 0.687	<0.687	<0.687	<0.10	< 0.687	< 0.687	<0.687
cis-1,3-Dichloropropene	µg/m³	0.454	<0.454	<0.454	<0.454	<0.454	<0.454	< 0.454	<0.454	<0.454	<0.454	<0.454	<0.10	<0.454	<0.454	<0.454
1.2-Dichloropropane	μg/m ug/m ³	0.454	<0.454	<0.454	<0.454	<0.454	<0.454	<0.454	<0.454	<0.454	<0.454	<0.454	<0.10	<0.454	<0.454	<0.454
Bromomethane	µg/m³	0.388	<0.388	<0.388	<0.388	<0.388	<0.388	<0.388	<0.388	<0.388	<0.388	<0.388	<0.10	<0.388	<0.388	<0.388
Bromoform	µg/m²	2.07	<2.07	<2.07	<2.07	<2.07	<2.07	<2.07	<2.07	<2.07	<2.07	<2.07	<0.20	<2.07	<2.07	<2.07
Bromodichioromethane Dibromochloromethane	μg/m ³	1.34	<1.34	<1.34	<1.34	<1.34	<1.34	<1.34	<1.34	<1.34	<1.34	<1.34	<0.20	<1.34	<1.34	<1.34
Trichloroethylene	μg/m ³	0.537	<0.537	1.02	1.24	1.59	<0.537	<0.537	<0.537	<0.537	0.566	<0.537	1.01	<0.537	11.7	<0.537
Tetrachloroethylene	µg/m³	0.678	< 0.678	3.55	4.49	4.43	1.84	2.08	8.87	< 0.678	0.991	0.792	1.86	< 0.678	1.40	< 0.678
Benzene	µg/m°	0.319	0.529	0.366	1.35	1.31	<0.319	<0.319	<0.319	<0.319	0.950	<0.319	<0.10	<0.319	0.923	<0.319
Ethylbenzene	μg/m ²	0.434	<0.434	<0.434	<0.434	<0.434	<0.434	<0.434	<0.434	<0.434	<0.434	<0.434	<0.10	<0.434	<0.434	<0.434
p+m-Xylene	µg/m³	0.868 - 1.30	< 0.868	< 0.868	1.11	1.08	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	< 0.868	< 0.20	< 0.868	<1.30	< 0.868
o-Xylene Styrono	μg/m ³	0.434	<0.434	<0.434	<0.434	<0.434	< 0.434	< 0.434	<0.434	<0.434	<0.434	<0.434	<0.10	<0.434	0.608	<0.434
4-ethyltoluene	μg/m ³	2.46	<0.426	<0.426	<0.426	<0.426	<0.426	<0.426	<2.41	<0.426	<0.426	<0.426	<0.10	<0.426	<0.426	<0.426
1,3,5-Trimethylbenzene	µg/m²	2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	< 0.50	<2.46	<2.46	<2.46
1,2,4-Trimethylbenzene	μg/m ³	2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<2.46	<0.50	<2.46	<2.46	<2.46
Benzyl chloride	μg/m ug/m ²	0.46	<0.460	<0.460	<0.460	<0.460	<0.460	<0.460	<0.460	<0.460	<0.460	<0.460	<0.10	<0.460	<0.460	<0.460
1,3-Dichlorobenzene	µg/m³	2.4	<2.40	<2.40	<2.40	<2.40	<2.40	<2.40	<2.40	<2.40	<2.40	<2.40	<0.40	<2.40	<2.40	<2.40
1,4-Dichlorobenzene	µg/m³	0.601	< 0.601	< 0.601	< 0.601	< 0.601	< 0.601	< 0.601	< 0.601	< 0.601	< 0.601	< 0.601	<0.10	< 0.601	< 0.601	< 0.601
1,2-Dichlorobenzene 1.2.4-Trichlorobenzene	µg/m²	0.601	<0.601	<0.601	<0.601	<0.601	<0.601	<0.601	<0.601	<0.601	<0.601	<0.601	<0.10	<0.601	<0.601	<0.601
Hexachlorobutadiene	μg/m ²	5.33	<5.33	<5.33	<5.33	<5.33	<5.33	<5.33	<5.33	<5.33	<5.33	<5.33	<0.50	<5.33	<5.33	<5.33
Hexane	µg/m³	1.06	<1.06	<1.06	3.33	3.17	2.93	<1.06	1.71	<1.06	7.14	<1.06	< 0.30	<1.06	6.03	<1.06
Heptane Cyclobeyane	μg/m ³	1.23	<1.23	<1.23	1.89	1.34	1.48	1.50	1.33	<1.23	1.92	<1.23	<0.30	<1.23	<1.23	<1.23
Tetrahydrofuran	μg/m ²	0.688	<0.088	<0.688	<1.18	<1.18	<0.688	<0.688	<0.088	<0.688	<1.18	<0.688	<0.20	<0.088	92.6 <1.18	<0.688
1,4-Dioxane	µg/m³	3.6	<3.60	<3.60	<3.60	<3.60	<3.60	<3.60	<3.60	<3.60	<3.60	<3.60	<1.0	<3.60	<3.60	<3.60
Naphthalene Tatal Valence	µg/m³	2.62	<2.62	<2.62	<2.62	<2.62	<2.62	<2.62	<2.62	<2.62	<2.62	<2.62	< 0.50	<2.62	<2.62	<2.62
1,1,1,2-Tetrachloroethane	μg/m² μg/m²	1.3 - 1.74 0.687	<1.30	<0.687	<0.687	<1.30	<1.30	<1.30	<1.30	<1.30	<1.30	<1.30	<0.30	<1.30	<1.74	<1.30
Vinyl Bromide	μg/m ²	0.875	<0.875	<0.875	<0.875	<0.875	<0.875	<0.875	<0.875	<0.875	<0.875	<0.875	<0.20	<0.875	< 0.875	<0.875
Propene	µg/m²	0.861-31.0	<3.10	<1.72	73.2	72.7	<2.93	<0.861	89.2	<0.861	38.9	<3.10	<1.0	<1.55	<31.0	<0.861
2,2,4-Trimethylpentane	μg/m ²	0.934	<0.934	<0.934	3.03	2.95	<0.934	<0.934	<0.934	< 0.934	4.56	<0.934	<0.20	<0.934	8.17	<0.934
Vinyl Acetate	μg/m	0.704 - 4.23	<1.50	<1.56	<1.50	<1.50	0.11	3.69 <0.704	<1.50	>.48	<1.50	<0.704	4.11	25./ <0.704	<1.50	<1.56
Notes: <	Not Analyzed Below Laboratory MDL															

Former Montfort Landfill, Red Deer, Alberta

Table A6 Summary of Analytical Results for Siloxanes in Soil Vapour

			Soil Vapour Probes											
Sample ID			VW-01	VW-03	vw	/-05	XCG-1(SVP)	XCG-2(SVP)	XCG-4(SVP)	XCG-6(SVP)	XCG-10(SVP)	XCG-13(SVP)		
Laboratory	Units	Reportable Detection Limit	ALS	ALS	A	LS	ALS	ALS	ALS	ALS	ALS	ALS		
Tube ID			G0150695SVI	G0150687SVI	G0150642SVI	G0150640SVI	G0150699SVI	G0150637SVI	G0150637SVI	G0150069SVI	G0150698SVI	G0150688SVI		
Laboratory ID			L1901643-2	L1901643-1	L1901643-3	L1901643-4	L1901643-5	L1901643-8	L1901643-8	L1901643-7	L1901643-9	L1901643-6		
Date Sampled	1		12-Mar-17	12-Mar-17	11-Mar-17	11-Mar-17	11-Mar-17	11-Mar-17	14-Mar-17	13-Mar-17	12-Mar-17	12-Mar-17		
hexamethyl cyclotrisolxane	$\mu g/m^3$	170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170		
octamethyl cyclotetrasiloxane	$\mu g/m^3$	170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170		
decamethyl cyclopentasiloxane	$\mu g/m^3$	170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170		
dodecamethyl cyclohexasiloxane	$\mu g/m^3$	170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170		
hexamethyldisiloxane	$\mu g/m^3$	170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170		
octamethyltrisiloxane	$\mu g/m^3$	170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170		
decamethyltetrasiloxane	$\mu g/m^3$	170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170		
dodecamethylpentasiloxane	μg/m ³	170	<170	<170	<170	<170	<170	<170	<170	<170	<170	<170		
Notes:		<u> </u>												

Below Laboratory RDL



Table A7 Summary of Deminimus Screening of Detected Soil Vapour Concentrations

All detected soil vapour concentrations were compared to a deminimum soil vapour criteria (calculated as per below). Parameters with concentrations detected which exceeded the deminimus soil vapour criteria were considered potential contaminants of concern for indoor air and were included in the indoor air testing program.

$$Csv_{Deminimus} = \frac{Cair}{alpha}$$

where

 $Csv_{Deminimus} = Deminimus$ Concentration of Soil Vapour

Cair = Health Based Indoor Air Criteria (based on toxicity reference values)

alpha = vapour attenuation factor Deminimus Alpha = 0.01 (default, as per Alberta Environment)

	Deminimus Screening					
Chemical	Soil Vapour Screening (μg/m³)	Soil Vapour Screening (μg/m³)	Worst case concentration in soil vapour probes (including probes within the limit of waste)	Location	Include in Indoor Air Testing? (Y/N)	
trans-1,2-dichloroethylene	1.79E+02	179	5.49	XCG-13(SVP)	N	
1,2-dibromoethane	1.80E+02	180	0.768	RDL in all	N	
1,2-dichlorobenzene	3.85E+04	38,482	0.601	RDL in all	N	
styrene	4.60E+03	4,600	2.41	XCG-4(SVP)	N	
1.3.5-trichlorobenzene	7.20E+01	72	*not measured in SV. S	See note below.	N	
1.1.2-trichloroethane	3.58E+02	358	0.546	RDL in all	N	
Ethane	8.13E+05	813.000	318	XCG-4(SVP)	N	
Ethylene	1.74E+05	174,000	8400	VW-05	N	
Methane	1.5E+6 to <7.6E+6 ug/m3	1,500,000 to <7,600,000 ug/m3	37,393,865.03 (5.7%)	XCG-4(SVP)	Y	
Deserves	1.805 - 04	1 800 000	524	Non-detect in all, XCG-2 (SVP) was	N	
Propane	1.80E+00	17 800	324		IN N	
1.2. dishlaratatashusuthan (Preon 12)	1./0E+04 7.00E+04	17,800	2930	AUG-15(SVP)	IN N	
1,2-dichlorotetrafiuoretnane (R114)	7.00E+00	1,000,000	1/90	VW-03	IN N	
Uniorometnane	1.80E+08	1,800	4.39	VW-01	IN N	
Vinyl Chloride	1.14E+02	200,000	1250	v w-05 (duplicate)	Y	
Chloroethane	2.00E+05	200,000	23.2	V W-05	N	
Trichlorofluormethane (Freon 11)	2.00E+04	20,000	5.92	VW-05	N	
Ethanol (Ethyl Alcohol)	1.90E+06	618,000	180	XCG-4(SVP)	N	
2-Propanol (isopropyl alcohol)	4.91E+05	491,000	2.46	RDL in all	N	
2-Propanone (acetone)	6.18E+05	618,000	47.5	elevated RDL bc of matrix interference XCG-6(SVP)-	N	
Mathyl Ethyl Katona (2 Butanona)	1.005+05	100.000	6 10	matrix interference	N	
1 4-dichlorobenzene	1.90E+03	1.900	0.601	RDL in all	N	
1 1 -dichlorethylene	4.00E+03	4.000	5.72	XCG-13(SVP)	N	
cis-1 2-dichloroethylene	1 79E+02	179	223	XCG-13(SVP)	V	
methylene chloride (dichloromethane)	4 35E+04	43.478	225	RDL in all	N	
chloroform	5 60E+02	560	21.7	VW-03	N	
1 1 1-trichloroethane	2.00E+04	20.000	0.937	VW-05 (duplicate)	N	
trichloroethylene (undated)	8 00F+02	800	11.7	XCG-13 (SVP)	N	
tetrachloroethylene	8 00F±02	800	12.6	XCG-10(SVP)	N	
henzene	3.03F±02	303	1 35	VW-05	N	
toluene	1 905±02	100 000	6.61	VW_05	N	
PHC F1	5 95F±04	59 532	5830	XCG-13(SVP)	N	
PHC F2	2 78F±04	27 778	972	XCG-13(SVP)	N	
ethylbenzene	5.00F+04	50 000	0.434	RDL in all	N	
engibenzene	3.00E+04	50,000	0.404	XCG-13(SVP)- elevated RDL bc of		
total xylenes	9.00E+03	9,000	1.74	matrix interference	N	
1,3,5-trimethylbenzene	4.00E+02	400	2.46	RDL in all	N	
1,2,4-trimethylbenzene	4.00E+02	400	2.46	RDL in all	N	
hexane	1.40E+04	14,000	7.14	XCG-6(SVP)	N	
heptane	8.00E+03	8,000	1.92	XCG-6(SVP)	N	
cyclohexane	1.20E+05	120,000	92.6	XCG-13(SVP)	N	
tetrahydrofuran	4.00E+04	40,000	1.18	RDL in all	N	
propene	6.00E+04	60,000	89.2	XCG-4(SVP)	N	
2,2,4-trimethylpentane	6.42E+04	64,173	8.17	XCG-13(SVP)	N	
carbon disulfide	2.00E+03	2,000	25.7	XCG-12(SVP)	N	

Notes

1. Methane screening will be completed in accordance with Table 6, Draft Soil and Building Methane Gas Management Guide, Oct 2013, (Alberta Health Services)

*1,3,5-trichlorobenzene was detected	in MW-06 but not measured in soil vapour because of the fol	owing:	
(note that MW-06 is assumed to be wi	thin the limit of waste, and therefore 1,3,5-trichlorobenzene	vas not under consideration for indoor air testing)	
Henry's Law Constant (HCL)	1.9x 10-3 atm m ³ /mol		
Convert to HLC (unitless)	0.077661031		
Concentration of 1,3,5-trichlorobenze	ne detected in Groundwater	0.73 µg/L	
Using Henry's Law to convert to soil v	apour concentration =		
$Csv = Cgw (\mu g/L) X HCL(unitless) x$	1,000 L/m ³		
Concentration in Soil Vapour = Csv =	$0.73 \ \mu g/L \ ^{\ast} \ 0.077661 \ ^{\ast} \ 1,000 \ L/m^{3} =$	56.69 µg/m ³	
This concentration is less than the soil cause a soil vapour concentration to e:	vapour screening value of $72 \ \mu g/m^3$. Therefore, even with v sceed the demininums screening concentrations.	ery conservative assumptions, groundwater at concentrations detected would no	ıt



ATTACHMENT B XCG SOP FOR INDOOR AIR SAMPLING



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INDOOR AIR QUALITY SAMPLING USING SUMMA® CANISTERS

1. BACKGROUND

Indoor air quality is often evaluated at contaminated sites where existing buildings may be impacted by volatile or semi-volatile chemicals. Assessment of contaminant concentrations in the indoor air of the building may be an important exposure pathway to consider when evaluating potential human health risks at a site.

2. PURPOSE

The collection of indoor air quality samples using a Summa® canister allows for multiple VOCs to be analyzed using one sample. Samples can be reanalyzed because of the stability of the sample in the canister, and the small amount of sample which is required for analyses. Summa® canister sampling is ideal for time-weighted average (TWA) sampling (e.g. 8 hours, 24 hours). In addition, it is not required that the range of concentrations be known prior to sampling, although if high concentrations are expected, it is best to inform the laboratory ahead of time. In cases where concentrations are potentially high, they may recommend the use of borosilicate glass canisters.

3. SCOPE

This document describes the procedure for sampling indoor air quality using a Summa® canister.

4. SITE CHARACTERIZATION

Indoor air quality sampling should be conducted after all potential vapour sources (e.g. nonaqueous phase liquids, contaminated soil, and groundwater) have been characterized. In addition, the physical setting of the site should be known, including (if applicable):

- Geology (soil textures, stratigraphy);
- Hydrogeology (depth to groundwater, groundwater flow direction, vertical and lateral gradients, hydraulic conductivity);
- Vadose zone characteristics including water content, porosity, fraction of organic carbon, bulk density, and soil-air permeability;
- Preferential pathways, such as subsurface utilities;
- Building construction [location, use, size, height, foundation type, foundation characteristics, heating, ventilation, and air conditioning (HVAC)]; and
- Vertical and lateral distance from soil vapour sources to buildings.

5. SITE CONDITIONS

The MOECC may require that indoor air quality samples are collected at a time when the surrounding ground is frozen, as well as at another time when it is not frozen. On the day of sampling, weather conditions including outdoor and indoor air temperatures will be recorded. Information on barometric pressure and relative humidity during the sample



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collection period will be obtained from the nearest Environment Canada (or other) weather station, if the data is publically available.

6. LENGTH OF TIME

Eight hour flow regulators should be used for commercial, institutional and industrial indoor air quality sampling. Residential applications require a 24 hour flow regulator.

7. EQUIPMENT

Laboratories need several days notice to deliver SUMMA® canisters. The usual size for indoor air quality is 6 litres. If you are sampling at a different altitude, let the project manager know so that the flow controller can be adjusted to reflect this difference.

Required from the Laboratory:

- One travel blank SUMMA® canister filled with purified air that is taken to the field, but not opened;
- One Summa® canister for each sample required, as well as an additional field duplicate for every 10 samples; and
- One flow regulator for each Summa® canister (see section 6 for the required length of time).

Additional Equipment:

- 2 x 9/16" wrenches;
- Barometer, Thermometer, and Hygrometer;
- PID or FID; and
- Nitrile Gloves.

Important Notes:

- Instruct the clients not to use glues, adhesives, paints, floor wax, or strong cleaners, etc, in the vicinity of the sampling for several days prior to sampling.
- Do not smoke, pump gas, use hand sanitizer, or handle any solvents prior to handling the Summa® canisters or any of the equipment. Avoid these activities on the day of sampling.

8. SAMPLING:

- 1. To attach the regulator on to the SUMMA® canister, remove the brass nut on the top and then hand-tighten the Swagelok® regulator nut on to the SUMMA® canister. Use a 9/16" wrench to make a quarter turn to tighten the regulator.
- 2. Label the paper tag affixed to the SUMMA® with the sample number, as well as which regulator will be associated with it.



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INDOOR AIR QUALITY SAMPLING USING SUMMA® CANISTERS

- 3. Label the field notes with the SUMMA® identification number and the regulator number, as well as the initial SUMMA® vacuum and the final SUMMA® vacuum.
- 4. Record indoor and outdoor meteorological data for that time and date using the portable barometer, thermometer, and hygrometer, as well as Environment Canada (https://weather.gc.ca/canada_e.html).
- 5. Place the SUMMA® canister at a height of one to two metres above the ground, in an area that is away from doorways, HVAC outlets/inlets, and loading dock areas where idling vehicles might be present over the course of the day.
- 6. Open the SUMMA® canister by turning the Swagelok® valve counter-clockwise a quarter turn. Record the time and vacuum in the field notes.
- 7. Using the appropriate detector, record five ambient air readings taken over the course of a minute from either the PID or FID. Non-detect concentrations should be observed. This information may help to identify background conditions and evaluate potential biases.
- 8. Let the sampling continue for the appropriate length of time based on the regulator. Ideally, allow the sampling to continue for the full pre-determined period until the regulator reads between -8 inches Hg and -3 inches Hg. **Do not allow the regulator to reach a value of 0 inches Hg.** If sampling is progressing more quickly than expected, you may need to close the Swagelok® valve sooner than expected.
- 9. Prior to closing the Summa® canister, record five ambient air readings taken over the course of a minute from either the PID or FID.
- 10. Record the final vacuum reading and time. Close the Summa® canister by turning the Swagelok® valve clockwise. Remove the vacuum gauge. Using your fingers, replace the brass nut. Use the wrench to turn it a 1/4 turn.
- 11. If the sampling period was more than 1 hour, record indoor and outdoor meteorological data for that time and date using the portable barometer, thermometer, and hygrometer, as well as the Environment Canada website (https://weather.gc.ca/canada_e.html).
- 12. Summa® canisters do not need to be kept cold and can be shipped via airplanes and couriers. Hold time is 30 days (NB: some jurisdictions say 14 days depending on the compound in question).

9. **PERFORMING A DUPLICATE SAMPLE:**

1. A duplicate sample is taken by placing a secondary Summa® canister immediately adjacent to the primary Summa® canister. The outlets for both regulators should be as close together as possible. The sampling period does not change.



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10. CHECKING YOUR DATA:

Data reported in:

- ppbv (independent of P & T);
- μg/m³ (at 1 atm, 25 degrees C);
- 1 atm and 25 degrees C may not be representative of conditions at your site > results can be altered using the Gas Law Constant; and
- NB these do NOT correspond directly to water concentration units.

Ambient Air is composed of the following gases commonly known as "matrix gases" that do NOT need to be analyzed for indoor air quality sampling:

- Nitrogen 78%;
- Oxygen 21%; and
- 1% CO2, argon, helium.

11. ATTACHMENT

• Indoor Air Quality Field Sheet.



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INDOOR AIR QUALITY- SUMMA CANISTER SAMPLING

Date:	
Technician:	
Project Number:	
Site Address:	
Lab Identifier:	
Canister Number(s):	Regulator Number:

Starting Parameters:

Outdoor Barometric		Indo	or	Barom	netric		
Pressure:			Press	sure:			
Outdoor Temperature:		Indoor Temperature:					
Relative Humidity of			Wine	1 Directior	n & Spe	ed:	
Sampling			_				
Environment:							
PID readings - 5 in							
one minute:							
Start Time:			Start	ing Canist	er Vacu	um:	

Sample Height:	
Description of Sample	
Location (i.e. room,	
position within a	
building, exit number,	
building number, etc):	
Additional notes about	
condition of the floor	
and/or foundation (i.e.	
cracks, spills, stains,	
sumps, drains, utility	
conduits):	
HVAC conditions	
during sampling:	
Fireplace, furnace,	
fans present?	



Indoor sources of VOCs noted during sampling:	
Description of doors and windows and their usage (open, closed, high traffic through	
many times opened and closed in an hour)	

End Parameters:

Outdoor Barometric			Indo	or	Barom	netric	
Pressure:			Pres	sure:			
Outdoor Temperature:	J			Indoor Temperature:			
Relative Humidity of		Wind Direction & S			1 & Spe	ed:	
Sampling							
Environment:							
PID readings - 5 in							
one minute:							
End Time:			End	Canister V	acuum:		



ATTACHMENT C FIELD NOTES

Out door Indoor Air Quality- Summa Canister Sampling

Date:	Mar 13/17 - mar 14/17
Technician:	Na
Project Number:	4-2352-04-02
Site Address:	Residence I

Starting Meteorological Parameters:

Outdoor Barometric	1-10	Indoor Barometric	517.
Pressure:	101.5	Pressure:	N/A
Outdoor	1200 (-)	Indoor Temperature:	» (<i>[</i>)
Temperature:	-13C(-21WC)		MA
Relative Humidity of		Wind Direction & Speed:	181mllar
Sampling	734.		
Environment:			South

Ending Meteorological Parameters:

Outdoor Barometric Pressure:	100.7	Indoor Barometric Pressure:	N/A
Outdoor	1.2.0	Indoor Temperature:	NIA
Temperature:	1°C		174
Relative Humidity of		Wind Direction & Speed:	124 as lbs
Sampling	761		E FAVE AV
Environment:			SSE

Trip Blank Canister Number:			
Location of Duplicate Sample:			
Canister Number(s):	F	Regulator Number:	

Ambient Sample

Lab Identifier:	OAG	?		an man - Anna Barn at Luci a Landa an Anna an Anna Anna Anna Anna Anna			
Canister Number(s):	2595	,		Regulator N	lumber	: 9	55
Starting PID readings- 5 in 1 minute:	0	١		١	7	>	١
Start Time:	11:00	>	Star	ting Canister Vac	uum:	- 2	6.5
Ending PID readings- 5 in 1 minute:	0	١		0	١	۱.	R
End Time:	11:15		Endi	ng Canister Vacu	ium:	- 4	-5

Sample Height:	N2.3m above GS]
Description of Sample Location (ie. room, position within a building, exit number, building number, etc): HVAC conditions during sampling:	on back patio @ Residence I an patio table. Type:_N/A(On)(Off)	
Description of doors and windows and their usage (open, closed, high traffic through the doors, ie. how many times opened and closed in an hour)	N/A.	-

CH4 0.0 $CO_2 0.0$ $O_2 20.9$

.

6

Preliminary Assessment:

Potential Sources	Location(s)	Removed before Sampling? (Yes/No/NA)
Gasoline storage cans		
	he	
Gas-powered equipment		
	NO.	
Kerosene storage cans		
	no.	
Paints / thinners / strippers		· ·
	Yes-in garage	
Cleaning solvents		
	no.	
Oven cleaners		
	Yes-in fitche	
Carpet / upholstery cleaners	Rec Lugaria i	c. dia met
	ACCOUNT - VET	a secks.
Other house cleaning products	Tide trilet barg	1 NOS
	chaner, etc.	1 yes.
Moth balls	Dec. the in	
	gerage	
Polishes / waxes	A day	
	preage	
Insecticides		
	in garage.	
Furniture / floor polish		
	•	
Nail polish / polish remover	io ensuite	
	bathroom	
Hairspray		
	V V	
Cologne / perfume	m	

laundry machine area.

Air fresheners	no.	
Fuel tank (inside building)	no.	
Wood stove or fireplace	gas fireplace	-
New furniture / upholstery		
	no	
New carpeting / flooring	200	
•		
Hobbies - glues, paints, etc.	no.	
	-	

Additional notes about material Wall material: dupuell and condition of the floor and/or foundation and/or walls (ie. cracks, spills, stains, utility conduits): Floor material: Concret α Cracks? Epoxy or waterproof paint sealants? -fine crecks where slab visible Spills or stains? not visible. **Utility Conduits?** yes through slab.

Sumps	Sump:(yes) _∠ (no)
	Sump Pump:(yes) v (no)
	Water in sump: (ves) (no)
Floor Drains	
	neer turnace (bom)
	1 under
	laurez j
Fireplace, furnace or fans	
present?	
Is the room attached to a	Muest Inol A 1 -
garage?	(mil) upstairs.
Baraget	
	(gas powered equipment or fuel stored in garage)
Number of floors above grade:	
Are basements or crawlspaces	(No) \sqrt{YES} . Approx. Depth: (m)
present?	
Maintenance and repairs- has	
any nainting or staining been	nue :
dono in the part 6 months?	No.
	1 j
-	
Does anyone smoke in the	
facility or just outside any of	NO.
the doors or windows?	
Has there ever been a fire in	
the facility?	
	<u> </u>
Ground cover surrounding	and asolalit.
building:	Show 1 - 1
	· · · · · · · · · · · · · · · · · · ·
Is there a septic system on site?	(yes) (no)
Commercial or Industrial Facility- where are the uniforms laundered? Type of cleaner?	N/A
--	-----
Commercial or Industrial Facility- do any of the tools or equipment require sterilization? What process or chemical is used?	N/A
Other:	

•.



Address:	Residence A
Time/Date:	53°pm
Name of Person:	· ·



Potential Sources	Location(s)	Removed before Sampling? (Yes/ No/ N/A)
Gasoline storage cans	no	
Gas-powered equipment	(1	
Kerosene storage cans	11	
Paints / thinners / strippers	VI	
Cleaning solvents	×1	
Oven cleaners	1	
Carpet / upholstery cleaners)(
Other house cleaning products	maybe bethream	
Moth balls	no.	
Polishes / waxes	no	
Insecticides	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Furniture / floor polish	no	
Nail polish / polish remover	no.	
Hairspray	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Cologne / perfume	NO	
Air fresheners	no	



Fuel tank (inside building)	no	
Wood stove or fireplace	no,	
New furniture / upholstery	no.	
New carpeting / flooring	\sim	
Hobbies - glues, paints, etc.	$\mathcal{V} \mathcal{O}$:	

Additional notes about material and condition of the floor and/or foundation and/or walls (ie. cracks, spills, stains, utility conduits):	Wall material:
	Floor material: <u>copet</u> , tile.
	Cracks? Epoxy or waterproof paint sealants?
	Spills or stains?
	$\mathcal{N} \mathcal{O}$.
	Utility Conduits? Senitary steck.
Sumps	Sump:(yes)(no)
	Sump Pump:(yes)(no)
	Water in sump:(yes) (no) N/P



Residence A

X	CG	C C	on	su	lta	ints	Ltd.	
r	· I	7	`	•				

ACG Consultants Ltd.	/
Floor Drains	<u>ı∕(yes)</u> (no)
	mant of fime a
	a solver - 1
	1801011
Fireplace, furnace or fans	fina Can
present?	-jun let
Is the room attached to a	(yes)(no)
garage?	
	(car)
	(gas powered equipment or fuel stored in garage)
Number of floors above and	1
Number of hoors above grade:	5
Are basements or crawlspaces	(No) YES Approx Depth: (m)
present?	(NO) <u>v</u> _123. Approx. Depth(N)
present:	Q)
	E E
Maintenance and repairs- has	
any painting or staining been	
done in the past 6 months?	rю,
Door onvono emolio in the	
	hor
facility or just outside any of	
the doors or windows?	
Has there ever been a fire in	(yes) <u>v</u> (no)
the facility?	
Ground cover surrounding	
building.	gross, chicewant!
bullaing:	United in the second se
	herdscapping
Is there a septic system on site?	(yes) <u> </u>



Address:	Residence B
Time/Date:	Pec 5 2016.
Name of Person:	

Potential Sources	Location(s)	Removed before
		Sampling? (Yes/ No/ N/A)
Gasoline storage cans	00	
Gas-powered equipment	no	-
Kerosene storage cans	no	
Paints / thinners / strippers	yes-cupbo	rds in
Cleaning solvents		
Oven cleaners	no.	
Carpet / upholstery cleaners		
Other house cleaning products	launding .	
Moth balls	yes.	
Polishes / waxes		
Insecticides	yes-haid.	
Furniture / floor polish	NO.	
Nail polish / polish remover	no	
Hairspray	cn	
Cologne / perfume	\sim	
Air fresheners	fabric softener.	

Various cans of Raid, winder, etc. in launding room.



Fuel tank (inside building)	$\gamma \circ$.	
Wood stove or fireplace	pes.	
New furniture / upholstery	no.	
New carpeting / flooring	v0.	
Hobbies - glues, paints, etc.	ŕο.	

Additional notes about material and condition of the floor and/or foundation and/or walls (ie. cracks, spills, stains, utility conduits):	Wall material: drywall. good condition.
	Floor material: <u>cerpeted</u> . everywhere except whility room. good condition
	Cracks? Epoxy or waterproof paint sealants?
	Spills or stains? None Visible
	Utility Conduits? Yes some pipes through
Sumps	Sump:(yes)(no) 0 Sump Pump:(yes)(no) N/ (A / Water in sump:(yes) (no) N/ (A /

Residence \widehat{B}



ACG Consultants Ltd.	
Floor Drains	(yes) (no)
	utility room.
Fireplace, furnace or fans	
present?	Timece.
Is the room attached to a	(yes)(no)
garage?	(car)
	(gas powered equipment or fuel stored in garage)
Number of floors above grade:	
Are basements or crawlspaces	(No) YES. Approx. Depth: (m)
present?	yes a' all fill hoight.
	yes. U all hele help of
Maintenance and repairs- has	n seth
any painting or staining been	single board on Dec 4
done in the past 6 months?	no more.
Does anyone smoke in the	
facility or just outside any of	no.
the doors or windows?	
llos those such as a Circle	
Has there ever been a fire in	(yes) (no)
the facility?	
Ground cover surrounding	hade marka, grosslander
building:	Among () Oren Dear
	driver .
	0
Is there a septic system on site?	(yes) /(no)



Address:	Residence C
Time/Date:	430 Dec 6/16.
Name of Person:	

Potential Sources	Location(s)	Removed before
	mo	Sampling? (Yes/ No/ N/A)
Gasoline storage cans	.)2	
	11.5	
Gas-powered equipment	11)	
Kerosene storage cans	Z	
Paints / thinners / strippers	eld paint cen (1). Z.	to odeur Losed brigtime.
Cleaning solvents	no. (some be	throom
Oven cleaners	upstairs	
Carpet / upholstery cleaners	no.	
Other house cleaning products	see above.	
Moth balls	no.	
Polishes / waxes	no.	
Insecticides	-few weeks - ind.	Voc-free
Furniture / floor polish	ýo.	
Nail polish / polish remover	no	
Hairspray	n.0	
Cologne / perfume	$\gamma \sim $	
Air fresheners	no.	



Fuel tank (inside building)	no	
Wood stove or fireplace	yes-hesnit	
New furniture / upholstery	ecentral since JC	
	No	
New carpeting / flooring	upstairs-new a	a pet Inthago.
Hobbies - glues, paints, etc.	acrylic paints,	

Additional notes about material and condition of the floor and/or foundation and/or walls (ie. cracks, spills, stains, utility conduits):	Wall material: <u>drywall</u> - good condition.
	Floor material: <u>Compet/peinted</u> Sieb - good Condition.
	Cracks? Epoxy or waterproof paint sealants?
	no.
	Spills or stains?
	no,
	Utility Conduits? yes.
Sumps	Sump:(yes),(no)
	Sump Pump:(yes) (no)
	Water in sump:(yes) (no) N/A J



ACG Consultants Ltd.	_ /
Hoor Drains	<u>√(yes)</u> (no)
Fireplace, furnace or fans	
present?	
Is the room attached to a	(kves) (no)
garage?	
	(car) upstairs
	(gas powered equipment or fuel stored in garage)
Number of floore - house t	
Number of floors above grade:	
Are basements or crawlspaces	(No) YES, Approx, Depth: (m)
present?	
•	Ves B
Maintenance and repairs- has	
any painting or staining been	no.
done in the past 6 months?	
Does anyone smoke in the	
facility or just outside any of	no no
the doors or windows?	
Has there ever been a fire in	(yes) /(no)
the facility?	
Groupd cover surrounding	
building:	grass, driver
bullung.	S/-
	2
Is there a sentic system on site?	(ves) i (po)



Address:	Residence D
Time/Date:	Mon Dec 5/16 415
Name of Person:	· · ·

Beseneitt

Potential Sources	Location(s)	Removed before Sampling? (Yes/ No/ N/A)
Gasoline storage cans	40	
Gas-powered equipment	11	
Kerosene storage cans	11	
Paints / thinners / strippers	۱۱	
Cleaning solvents	11	
Oven cleaners	۱۸	
Carpet / upholstery cleaners	١١	
Other house cleaning products	۱۸	
Moth balls	, \	
Polishes / waxes	11	
Insecticides	\ر	
Furniture / floor polish	1	
Nail polish / polish remover	1	
Hairspray	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Cologne / perfume	11	
Air fresheners	N	

Res	iden	ce D
-----	------	------



XCG Consultants Ltd.

Fuel tank (inside building)	no,	
Wood stove or fireplace	no.	
New furniture / upholstery	no.	
New carpeting / flooring	ino,	
Hobbies - glues, paints, etc.	no = decade	5
	vo ode	w.

Additional notes about material and condition of the floor and/or foundation and/or walls (ie. cracks, spills, stains, utility conduits):	Wall material: <u>drywall</u> . Sociel condition
	Floor material: <u>tike on skeb</u> . Visible sleb in good condition.
	Cracks? Epoxy or waterproof paint sealants?
	Spills or stains? 1200 yes - See hobbies
	Utility Conduits?
Sumps	Sump:(yes)(no) Sump Pump:(yes) /_ (no)
	Water in sump:(yes) (no) $\mathcal{W} \rightarrow \mathcal{A}$.
Sanitary 5 Through bes	teck runs down event flr. 2



Residence D

ACG Consultants Ltd.	
Floor Drains	(yes) 🗹 (no)
Firenlace furnace or fans	0
procent?	Gas - Tur Vale-
present:	
Is the room attached to a	(yes) (no)
garage?	
	(car)
	(gas new and aquipment or fuel stared in garage)
Number of floors above grade:	<u>Э</u>
	\sim
Are basements or crawlspaces	(No) (VES Approx Depth) (m)
present?	
present.	B'rea 5' crawl space
Maintenance and repairs- has	
any painting or staining been	$\gamma \omega$
done in the past 6 months?	
Does anyone smoke in the	
facility or just outside any of	
the doors or windows?	
Has there ever been a fire in	(ves) (no)
the facility?	
-	
Ground cover surrounding	grass, asshalt drive in ,
building:	
	gerden.
Is there a septic system on site?	(yes)(no)

1/2 crawl space, 1/2 reg. height.

÷



Address:	Residence E
Time/Date:	6 Dec 16 530.
Name of Person:	

Potential Sources	Location(s)	Removed before
		Sampling? (Yes/ No/ N/A)
Gasoline storage cans	no	
Gas-powered equipment		
Kerosene storage cans	16	
Paints / thinners / strippers	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Cleaning solvents	N,	
Oven cleaners	11	
Carpet / upholstery cleaners	14	
Other house cleaning products	11	
Moth balls	W	
Polishes / waxes	11	
Insecticides	N.	
Furniture / floor polish	n	
Nail polish / polish remover	"	
Hairspray	11	
Cologne / perfume	bedroom	
Air fresheners	ino	

ductwork runs to gerage thom crawl space => Flaps in garage.



Fuel tank (inside building)	\cdot ∞	
Wood stove or fireplace	noi	
New furniture / upholstery	ino.	
New carpeting / flooring	no.	
Hobbies - glues, paints, etc.	sodering iron, phatomounting (dr phatosolutions	ymaunt) Znot used

Additional notes about material and condition of the floor and/or foundation and/or walls (ie. cracks, spills, stains, utility conduits):	Wall material: drywall ,
	Floor material: <u>Cotpet</u> to bare Slab.
	Cracks? Epoxy or waterproof paint sealants? Yes. No Sealant.
	Spills or stains?
	Utility Conduits? Yes.
Sumps	Sump:(yes) $\sqrt{(no)}$
	Water in sump:(yes) (no) $N/42$.

-fresh cir returns L> 4 upsteirs or main level.

Residence E



XCG Consultants Ltd.			
Floor Drains	1_(yes) (no)		
	FUNCE, FORM		
Fireplace, furnace or fans	C C		
present?	survace.		
Is the room attached to a	(xes) (no)		
garage?	(car)		
	(gas powered equipment or fuel stored in garage)		
Number of floors above grade:	2 store i sodit.		
	a siding frit.		
Are basements or crawlspaces	(No) VYES Approx Depth: (m)		
present?			
	6'cs, 9'		
Maintenance and repairs- has			
any painting or staining been	no.		
done in the past 6 months?			
Does anyone smoke in the	indoor smoking.		
facility or just outside any of			
the doors or windows?			
Has there ever been a fire in	(ves) (no)		
the facility?			
Ground cover surrounding			
building:	grass, garden,		
	anventry		
)		
Is there a septic system on site?	(ves) V (no)		

XCG Consultants Ltd. Indoor Air Sampling - Preliminary Assessment:

Address:	Residence F
Time/Date:	6'5 Dec 6/16.
Name of Person:	

Potential Sources	Location(s)	Removed before Sampling? (Yes/ No/ N/A)
Gasoline storage cans	no	
Gas-powered equipment	11	
Kerosene storage cans	ni.	
Paints / thinners / strippers		
Cleaning solvents	in	
Oven cleaners	\(
Carpet / upholstery cleaners	11	
Other house cleaning products	Yes => will man	x to gerage.
Moth balls	1	
Polishes / waxes	N	
Insecticides	W	
Furniture / floor polish	Vinyl cleaner up	stairs - Rinse-Tree Cleaner-Mennin
Nail polish / polish remover	i۸	ter
Hairspray	1	
Cologne / perfume	~\	
Air fresheners	IL	

Glycol Ethers, Al Kyl Phenol, EDTA Sodium Salt

1



Fuel tank (inside building)	ho	
Wood stove or fireplace	Ves-ups	teirs
New furniture / upholstery		
	n0	
New carpeting / flooring	not in basen	ent
Hobbies - glues, paints, etc.	Loupstar	S-Inthold,
	spray starch, adhesite	=> Quilting.

Additional notes about material and condition of the floor and/or foundation and/or walls (ie. cracks, spills, stains, utility conduits):	Wall material: <u>Ayubl</u> , Jood condition.
	Floor material: <u>tile</u> , <u>caspet</u> , <u>Slab</u> good cardition shar than below .
	Cracks? Epoxy or waterproof paint sealants? Cracks? Epoxy or waterproof paint sealants? Cracks? Epoxy or waterproof paint sealants? LS physeod covering area Spills or stains? Spills or stains? No, Spened, Clay Mo, Mo, Mo
Sumps	Utility Conduits? Sonitory Stack Sump: _(yes) _(no)
	Sump Pump:(yes)(no) Water in sump:(yes) (no)

Residence F



iteo consultants fita.	
Floor Drains	(yes) (no)
	5 marsha
	Junece 100mm
Fireplace, furnace or fans	
present?	-funce.
prosent.	
Is the room attached to a	(ha)
is the room attached to a	
garage?	(m) al mice DS lawmoused
	(di) Channeler (
	[(gas powered equipment or fuel stored in garage)
Number of floren to the	
Number of floors above grade:	1
	/
Are basements or crawlspaces	(No) 🗹 YES. Approx. Depth:(m)
present?	
	B'
Maintenance and repairs- has	minting unstains.
any painting or staining been	formand about
done in the past 6 months?	
done in the past o months!	
Does anyone smoke in the	previous owners
facility or just outside any of	
the doors or windows?	
Has there ever been a fire in	(yas) b (na)
the facility?	
Ground cover surrounding	
Ground cover surrounding	driver part, concrete.
building:	
	grass, hasas apring
)
Is there a septic system on site?	(yes) 🖌 (no)



Address:	Residence G
Time/Date:	6'5pm Decb/16
Name of Person:	

Potential Sources	Location(s)	Removed before Sampling? (Yes/ No/ N/A)
Gasoline storage cans	ino	
Gas-powered equipment	11	
Kerosene storage cans	1/	
Paints / thinners / strippers	Low VOC acrylic	
Cleaning solvents	mo.	
Oven cleaners	upstairs	
Carpet / upholstery cleaners	no.	
Other house cleaning products	basics under si in bathroom. bl	ki ka
Moth balls	no.	
Polishes / waxes	no.	
Insecticides	n0.	
Furniture / floor polish	no, polished for	oors 2x/upstairs.
Nail polish / polish remover	No.	
Hairspray	occossionally	
Cologne / perfume	Not much besen	ent
Air fresheners	۱۱	

"Demp Tramp" in Washroom *Bona, Stone, Tite, & Laminate Foor cleaner.

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XCG Consultants Ltd.

Fuel tank (inside building)	no	
Wood stove or fireplace	not hooked up	
New furniture / upholstery	no	
New carpeting / flooring	no	
Hobbies - glues, paints, etc.	Spray storch, adhesive (qu	itting).

Additional notes about material and condition of the floor and/or foundation and/or walls (ie. cracks, spills, stains, utility conduits):	Wall material: <u>drywall</u> . good condition
	Floor material: <u>Capet</u> , <u>S</u> (ab (concrete) good condition,
	Cracks? Epoxy or waterproof paint sealants?
	Spills or stains?
	Utility Conduits? es- sonitary
Sumps	Sump:(yes) \swarrow (no) Sump Pump:(yes) \checkmark (no) Water in sump:(yes) (no) $\land \land \land \land$



Floor Drains	(ves) (no)
	Sumace mon
Fireplace, furnace or fans	C. Acco
present?	firepicate.
Is the room attached to a	(yes)(no)
garage?	
	(car)
	(gas powered equipment or fuel stored in garage)
Number of floors above grade:	
Are basements or crawlspaces	(No) _:YES. Approx. Depth:(m)
present?	2 ¹
Maintenance and repairs- has	mint of upsteirs both
any painting or staining been	deriver of a state of
done in the past 6 months?	- oge syrs ago
Does anyone smoke in the	
facility or just outside any of	no.
the doors or windows?	
	,
Has there ever been a fire in	(ves) (no)
the facility?	
Ground cover surrounding	andra anes
building:	Star 1 2172-1
	hasdscoping, driveway
	U U
Is there a sentic system on site?	(ves) (no)
is there a septie system on site.	



Address:	Deck	630
Time/Date:		Z
Name of Person:	۲	
		Mon/Tues

Potential Sources	Location(s)	Removed before
		Sampling? (Yes/ No/ N/A)
Gasoline storage cans	no	
Gas-powered equipment	no.	
Kerosene storage cans	no	
Paints / thinners / strippers	mo.	
Cleaning solvents	ino.	
Oven cleaners	no.	
Carpet / upholstery cleaners	no,	
Other house cleaning products	no.	
Moth balls	No.	
Polishes / waxes	1)	
Insecticides	11	
Furniture / floor polish))	
Nail polish / polish remover	no.	
Hairspray	33	
Cologne / perfume	**	
Air fresheners	υ	



		-			-	-	
X	CG	Co	nsu	lta	nts	Ltd.	

Fuel tank (inside building)	no.	
Wood stove of fireplace	yes-gas	
New furniture / upholstery	γ_{NO} ,	
New carpeting / flooring	mo, (binningte- Byrs stal)	
Hobbies - glues, paints, etc.	no,	

Additional notes about material and condition of the floor and/or foundation and/or walls (ie. cracks, spills, stains, utility conduits):	Wall material: <u>Concrete</u> , insulation/studs.
	Floor material: <u>Concrete</u> good condition,
-	Cracks? Epoxy or waterproof paint sealants? Miner Crack one area.
	Spills or stains?
	Utility Conduits? Sonitory.
Sumps	Sump:(yes)(no) Sump Pump:(yes)(no)
	water in sump:(yes) (no) 1 / 4 .



Floor Drains	<u>iv(yes)</u> (no)
Fireplace, furnace or fans	
present?	Funace.
Is the room attached to a	v(yes) (no)
garage?)	
Survey Chint	(car)
is + ottoched	(gas powered equipment or fuel stored in garage)
sarage.	
Number of floors above grade:	
internet of neers above grade.	
Are basements or crowlenacor	(No) VEC Approx Donth:
Are basements of clawispaces	(NO)TES. Approx. Depth:(M)
present?	a^{\prime}
	\mathcal{D}
Maintonanco and ronaire has	
Maintenance and repairs- has	10-0
any painting or staining been	1101
done in the past 6 months?	
Does anyone smoke in the	
facility or just outside any of	
facility of just outside any of	
the doors or windows?	
	//
Has there ever been a fire in	(yes)(no)
the facility?	
Ground cover surrounding	anse horderaina
building:	Sim I working I
	paving
Is there a septic system on site?	(yes) V (no)

Preliminary Assessment:

Potential Sources	Location(s)	Removed before Sampling? (Yes/No/NA)	
Gasoline storage cans	no.	-	
Gas-powered equipment	h6.		
Kerosene storage cans	no.		
Paints / thinners / strippers	Under besement Longt opened in later / parulic	stairs not n 4 yrs. reme	wed.
Cleaning solvents	NO.		
Oven cleaners	no.		
Carpet / upholstery cleaners	Mo.		
Other house cleaning products	Yes-between in beservert		
Moth balls	MO.		
Polishes / waxes	eledge Goo Gone	no-under titchen sinte.	
Insecticides	vho.		
Furniture / floor polish	see above.	х	
Nail polish / polish remover	no.		
Hairspray	YO		
Cologne / perfume	no.		

Air fresheners	Febrcze Someti	res.
Fuel tank (inside building)	no.	
Wood stove or fireplace	gas fireplace	
New furniture / upholstery	No.	
New carpeting / flooring	NO .	
Hobbies - glues, paints, etc.	no.	

Additional notes about material Wall material: drypoll . and condition of the floor and/or foundation and/or walls (ie. cracks, spills, stains, utility conduits): Floor material: <u>Concrete</u> but carpet Cracks? Epoxy or waterproof paint sealants? 1 minor crack in funace room. Remainder covered. Spills or stains? none visible. Utility Conduits? in furnace room, through stab.

C	
Sumps	Sump:(yes)(no)
	Sump Pump:(yes) _1_(no)
	Water in sump:(yes) (no)
Floor Drains	(ves) (no)
	in furnace, laundry
	area.
Fireplace, furnace or fans present?	yes-gas.
Is the room attached to a	_(yes) _(no) => not directly =>
garage?	V(car) upstairs.
	(gas powered equipment or fuel stored in garage)
Number of floors above grade:	1
Are basements or crawlspaces	(No) YES, Approx, Depth: (m)
present?	
Maintenance and repairs- has	
any painting or staining been	
done in the past 6 months?	no.
r	
Does anyone smoke in the	
facility or just outside any of	NO.
the doors or windows?	
Has there ever been a fire in	(ves) (po)
the facility?	
Ground cover surrounding	4 N_4
building:	grass, caphala.
Is thore a continguation of the 2	
is there a septic system on site?	(yes) <u>√</u> (no)

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Commercial or Industrial Facility- where are the uniforms laundered? Type of cleaner?	NA
Commercial or Industrial Facility- do any of the tools or equipment require sterilization? What process or chemical is used?	N/A.
Other:	

...

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Indoor Air Quality- Summa Canister Sampling

Date:	Nor 13/17 - Mar 14/17
Technician:	Ma
Project Number:	4-2352-04-03
Site Address:	Residence A

Starting Meteorological Parameters:

Outdoor Barometric Indoor Barometric 1054 101.6. Pressure: Pressure: 16°C Indoor Temperature: Outdoor 7°C (-12°C WC) Temperature: **Relative Humidity of** Wind Direction & Speed: SIIKM/W 35% Sampling Environment:

Ending Meteorological Parameters:

Outdoor Barometric	100 0	Indoor Barometric	105 3
Pressure:	100.0	Pressure:	
Outdoor	000 (Indoor Temperature:	1700
Temperature:	ac (nowe)		
Relative Humidity of		Wind Direction & Speed:	DOIN ILC
Sampling	29-1		odentai
Environment:			SE

Trip Blank Canister Number:	-	
Location of Duplicate Sample:	<u>لي </u>	
Canister Number(s):	Regulator Number:	

to PSI (Dec/16) no changes

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Lab Identifier:	Residenc	ce A					
Canister Number(s):	275	8		Regulator N	lumber:	61	01
Starting PID readings- 5 in 1 minute:	æ	١		Э	ô	2	1
Start Time:	15:53	2	Startin	ng Canister Vac	uum:	~ 6	26.0
Ending PID readings- 5 in 1 minute:	Υ.	١		١	é	2	١
End Time:	15:4	3	Ending	g Canister Vacu	ium:	- 6	. O

Sample Height:	vlilm	
Description of Sample Location (ie. room, position within a building, exit number, building number, etc):	in room of FD off main room, adjacent to furnace r	som
HVAC conditions during sampling:	Type: <u>forced</u> air <u>/(On) (Off)</u>	
Description of doors and windows and their usage (open, closed, high traffic through the doors, ie. how many times opened and closed in an hour)	doors all open in besenent. Minimal in/out to exterior of house.	

\$9~

Indoor Air Quality- Summa Canister Sampling

Date:	Mar 13/17 - Mar 14/17
Technician:	Mal
Project Number:	4-2352-04-03
Site Address:	Residence B

Starting Meteorological Parameters:

Outdoor Barometric		Indoor Barometric	
Pressure:	101.6	Pressure:	105.5
Outdoor	FRAN	Indoor Temperature:	1. 20
Temperature:	-) (-8 WC	D	160.
Relative Humidity of		Wind Direction & Speed:	
Sampling	45%	•	ESE TKMW
Environment:			, , ,

Ending Meteorological Parameters:

Outdoor Barometric	_	Indoor Barometric	
Pressure:	100.0	Pressure:	105.3
Outdoor	22-1	Indoor Temperature:	
Temperature:	2°C (nowc)	·	17°C
Relative Humidity of		Wind Direction & Speed:	
Sampling	457.	·	SE OLO KM/W
Environment:	-		

Trip Blank Canister Number:		
Location of Duplicate Sample:		
Canister Number(s):	 Regulator Number:	

. т.,

 $C_{414} 0.0$ $C_{02} 0.1$ $O_2 21.5$ Y.LEL \bigcirc

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Lab Identifier:	Residenc	e B					
Canister Number(s):	Talle	36		Regulator N	umber:	13	99
Starting PID readings- 5 in 1	١	l		١	١		Õ
Start Time:	17:27		Starti	ing Canister Vac	uum:	-2	5.0
Ending PID readings- 5 in 1	1	١)	Č	>	١
End Time:	17:30	>	Endir	ng Canister Vacu	ium:	-6	.5

Sample Height:	NI.2m
Description of Sample Location (ie. room, position within a building, exit number, building number, etc): HVAC conditions during sampling:	Furnace room, off laundry room. Type: <u>forced</u> air <u>V(On)_(Off)</u>
Description of doors and windows and their usage (open, closed, high traffic through the doors, ie. how many times opened and closed in an hour)	pretty isolated from any direct exterior air influences.

Washing machine / dryer going C sample drop-off. Cleaning products removed to cheather area in basement, door closed. Lo no other changes to PSI Conducted Dec /16.

Indoor Air Quality- Summa Canister Sampling

Date:	Nor13/17 + Mac 4/17
Technician:	Mel
Project Number:	4-2352-04-03
Site Address:	Residence C

Starting Meteorological Parameters:

Outdoor Barometric Pressure:	101.6	Indoor Barometric Pressure:	105.7
Outdoor Temperature:	7°C (-12°CWC)	Indoor Temperature:	18°C
Relative Humidity of Sampling Environment:	387.	Wind Direction & Speed:	SIIKm/hr

Ending Meteorological Parameters:

Outdoor Barometric Pressure:	100.2	Indoor Barometric	105.4
Outdoor		Indoor Témperature:	1000
Temperature:	2°C (nowc)		10-0
Relative Humidity of		Wind Direction & Speed:	221-11-
Sampling	42%		der my vu
Environment:			SE

Trip Blank Canister Number: 🗶				
Location of Duplicate Sample:	innediately be	side other		
Canister Number(s):	250 Regulator Number:	1407		

no changes since PS.I Dec/10.

7

* Trip Blank: Some Consister Used for both SV + IA consisters. All Kept \$ together during shipping and ohen not in use.

Lab Identifier:	Residence	С			``>		5-300"	1
Canister Number(s):	1425	ଽୄୄ		Regulator N	lumber:	13	>68	
Starting PID readings- 5 in 1 minute:	ì	1		1	ε	>	١	1
Start Time:	15:32	>	Star	ting Canister Vac	uum:	26	01-27.	
Ending PID readings- 5 in 1 minute:	l	((1			
End Time:	3:29		Endi	ng Canister Vacu	ium:	6.0	- 9.0	

Sample Height:	liam
Description of Sample Location (ie. room, position within a building, exit number, building number, etc):	besement, under stairs near FD.
HVAC conditions during sampling:	Type: <u>forced</u> oir <u>(On)</u> (Off)
Description of doors and windows and their usage (open, closed, high traffic through the doors, ie. how many times opened and closed in an hour)	no door to 1st - Fir. minimal traffic in + out front door.

besement all open, incl. Furnace, hat water heater, etc.

CH4 0.0 O_2 $\partial_{1.3}$ $(O_2 O.1)$ XLEL O

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Indoor Air Quality- Summa Canister Sampling

Date:	$M_{2} = 13(17 - N_{2}) = 14/17$
Technician:	No Cl
Project Number:	4-2252-04-02
Site Address:	Residence D

Starting Meteorological Parameters:

Outdoor Barometric	1	Indoor Barometric	
Pressure:	102.1	Pressure:	105.1 Kta
Outdoor	-15°C	Indoor Temperature:	
Temperature:	(-33°CWC)	-	200
Relative Humidity of		Wind Direction & Speed:	
Sampling	4-21	•	SILVE
Environment:	107,		SIGKENIAV.

Ending Meteorological Parameters:

Outdoor Barometric		Indoor Barometric	
Pressure:	101.0	Pressure:	105.6
Outdoor		Indoor Temperature:	
Temperature:	-8(-10WC)		1900
Relative Humidity of		Wind Direction & Speed:	
Sampling	451	•	N 3Km/hr
Environment:	10/1		

Trip Blank Canister Number:			
Location of Duplicate Sample:			
Canister Number(s):		Regulator Number:	

no changes since PSIF Dec/16.

on stool in beserrent, NI.2m off-floor near furnace, utility conduits through floor.
Lab Identifier:	Residence	e D					
Canister Number(s):	18235	2		Regulator N	lumber	: 71	66.
Starting PID readings- 5 in 1 minute:	2	1		١	C	2	١
Start Time:	9:50	•	Starti	ng Canister Vac	uum:	-32	. O
Ending PID readings- 5 in 1 minute:	λ	١		R	c	2	R
End Time:	9:55	>	Endin	g Canister Vacu	ium:	-11	

Sample Height:	$\sim 1.2m$.	
Description of Sample Location (ie. room, position within a building, exit number, building number, etc):	on stool in basement	
HVAC conditions during sampling:	Type: <u>forced</u> air	
	_ <u>√(</u> On)(Off)	
Description of doors and windows and their usage (open, closed, high traffic through the doors, ie. how many times opened and closed in an hour)	minimal. Door to beservert closed from rest of how to keep cost upstairs.	se

$$C_{02}$$
 0.17.
 C_{114} 0.07.
 O_2 20.97.
 χ . LEL 0

Date:	MO-513/17 - Mas14/17.
Technician:	MCL_
Project Number:	8-4-2352-04-03
Site Address:	Residence E

Starting Meteorological Parameters:

Outdoor Barometric Pressure:	102.1	Indoor Barometric Pressure:	105.6
Outdoor Temperature:	-15°C (-23°C)	Indoor Temperature:	18°0
Relative Humidity of Sampling Environment:	45.7.	Wind Direction & Speed:	SIGKMAr

Ending Meteorological Parameters:

Outdoor Barometric	1-13	Indoor Barometric	i - c - ali
Pressure:	101.0	Pressure:	105.4
Outdoor	e (voida)	Indoor Temperature:	1. 20
Temperature:	-D (-(C WC)		16-0
Relative Humidity of		Wind Direction & Speed:	1
Sampling	4.51.		N3Km/m
Environment:			,

Trip Blank Canister Number:		
Location of Duplicate Sample:		
Canister Number(s):	 Regulator Number:	

9:32 -29.0. in Furnace room, which is also connected to craws space. 1.5m off floor on step-ladder.

no changes since PSI Dec/16.

1

Lab Identifier:	Residence	E					
Canister Number(s):	129			Regulator N	lumber:	7	57
Starting PID readings- 5 in 1 minute:	R	C)		à	0,	L	R
Start Time:	9:33	Э	Start	ing Canister Vac	uum:	-90	7.0
Ending PID readings- 5 in 1 minute:	3	9		2	2)	>	9
End Time:	9:40		Endi	ng Canister Vacu	ium:	- 9.	0

Sample Height:	v 1.5m
Description of Sample Location (ie. room, position within a building, exit number, building number, etc):	In furnace voom. Connector to craw1 space.
HVAC conditions during sampling:	Type: <u>forced</u> air
Description of doors and windows and their usage (open, closed, high traffic through the doors, ie. how many times opened and closed in an hour)	no direct pathway to exterior. 3 people living in hause-moderate door

traffic.

1 person lives in besevent, CA14 0.0 bedroom connected to CO2 0.1 funce room. Crawl space 02 20.8 used to store xmas decorations, etc.

Date:	Mar 13/17 - Mar 14/17
Technician:	MCL
Project Number:	4-2352-04-03
Site Address:	Residence F

Starting Meteorological Parameters:

Outdoor Barometric	1-10	Indoor Barometric	1-1-0
Pressure:	101.9	Pressure:	180.0.
Outdoor	1000	Indoor Temperature:	1000
Temperature:	(-17°C windchill)		15 C
Relative Humidity of	,	Wind Direction & Speed:	and inter 11.
Sampling	40.1		SSE REMIN
Environment:			

Outdoor Barometric Pressure:	100.5	Indoor Barometric Pressure:	105.8
Outdoor	200 (Indoor Temperature:	1200
Temperature:	ac (no we)		
Relative Humidity of		Wind Direction & Speed:	
Sampling	45%		GE ITKM hv
Environment:	1 - 1.		

Trip Blank Canister Number:			
Location of Duplicate Sample:	-		
Canister Number(s):		Regulator Number:	

how voc paint, new door/ door-frame in past few weeks before sampling. Photograph of paint can included w/ site photos. No detectable odar noted. No other, changes since RSI (Dec/16)

Lab Identifier:	Residence	F					
Canister Number(s):	14918	i .		Regulator N	lumber	: 4	58
Starting PID readings- 5 in 1 minute:	١	E)	0		١	(
Start Time:	12:38		Star	ting Canister Vac	uum:	- 0	10.0
Ending PID readings- 5 in 1 minute:	· L	(l	Ś	>	0
End Time:	12:30		Endi	ng Canister Vacu	ium:	-7.	0

Sample Height:	1.2m on stepledder
Description of Sample Location (ie. room, position within a building, exit number, building number, etc):	in furnace room A FD vol door open.
HVAC conditions during sampling:	Type: Forced Air
	<u>↓ (On) (Off)</u>
Description of doors and windows and their usage (open, closed, high traffic through the doors, ie. how many times opened and closed in an hour)	windows closed. Door to furnace room open to rest of house. Door to exterior opened a few times only
new door,	during sample. painting in past
tew weeks.	

L) Minwar photos on comera.



Date:	Mar 13/17 - Mar 14/17	
Technician:	MCL	
Project Number:	4-2352-04-03	
Site Address:	Residence G	

Starting Meteorological Parameters:

Outdoor Barometric		Indoor Barometric	
Pressure:	101.9	Pressure:	105.9
Outdoor	-12°C	Indoor Temperature:	11 00
Temperature:	(-17 WC).		160
Relative Humidity of		Wind Direction & Speed:	
Sampling	24-1		SSE IOKMW
Environment:			

Outdoor Barometric Pressure:	100.5	Indoor Barometric Pressure:	1057
Outdoor	and (nowe)	Indoor Temperature:	1
Temperature:			17°C
Relative Humidity of		Wind Direction & Speed:	
Sampling	36%		SE TKM/W
Environment:			

Trip Blank Canister Number:	
Location of Duplicate Sample:	
Canister Number(s):	Regulator Number:

No changes to Reliminary Site Inspection (Dec 2016)

Lab Identifier:	Residence	G					
Canister Number(s):	14531	\		Regulator N	lumber	: 12	576
Starting PID readings- 5 in 1 minute:	λ	0		0		\	O
Start Time:	12:53	Ş	Star	ting Canister Vac	cuum:	-9	00
Ending PID readings- 5 in 1 minute:	0	0		١	c	2	١
End Time:	12:50).	Endi	ng Canister Vacı	um:	- 5	,5

Sample Height:	NIM OFF-FLOOV	
Description of Sample Location (ie.	in-furnace room, doors	
number, building number, etc):	open, on step stool	
HVAC conditions during sampling:	Type: Freed air	
	<u> </u>	
	normal bla residents and	-
Description of doors and windows and their usage (open, closed, high	minimal Residents are and	iz,
traffic through the doors, ie. how	therefore gave ac	cess
many times opened and closed in an hour)	to XCG. All windows closed.	

GEM readings @ pick-up:

02 20.9 %. PID 2ppm Co2 0.1 %. CH4 0.1.1. 7. LEL = 0

Date:	Mar 13/17 - Mar 14/17
Technician:	MCL
Project Number:	4-2352-04-03
Site Address:	Residence H

Starting Meteorological Parameters:

Outdoor Barometric	1016	Indoor Barometric	1057
riessuie.		Pressure:	,,
Outdoor	FOR (OR)	Indoor Temperature:	11 20
Temperature:	-5(-5)		160.
Relative Humidity of		Wind Direction & Speed:	
Sampling	5040%		ESE TKM/W
Environment:			

Outdoor Barometric Pressure:	100.0	Indoor Barometric Pressure:	105.5	
Outdoor	000 (Indoor Temperature:		
Temperature:	are (nowe)		160	
Relative Humidity of		Wind Direction & Speed:		
Sampling	40%		SE JOKA/W	
Environment:				n ¹² , 14

Trip Blank Canister Number:	_		
Location of Duplicate Sample:			
Canister Number(s):	~~~~~	Regulator Number:	

no changes since PSI Dec/16.

Lab Identifier:	Residence	Н		٨			· · · · · · · · · · · · · · · · · · ·
Canister Number(s):	1836	»O.		Regulator N	lumbei	. 13	354
Starting PID readings- 5 in 1 minute:	N.	١		0		9	١
Start Time:	18.03	фm	Star	ting Canister Vac	:uum:	-2	6.0
Ending PID readings- 5 in 1 minute:	Ю	0		١	C	S	١
End Time:	18:15		Endi	ng Canister Vacı	ium:	-5	,5

Sample Height:	NIM
Description of Sample Location (ie. room, position within a building, exit number, building number, etc):	middle of beservent on stepladder
HVAC conditions during sampling:	Type: <u>force</u> dair <u>i(On)</u> (Off)
Description of doors and windows and their usage (open, closed, high traffic through the doors, ie. how many times opened and closed in an hour)	minimal. windows closed.

Besement completely open -> no berriers/walls.

CM4 0.0 CO2 0.1 02 21.6 1.LEL 0

Date:	Mar 13/17 - Mar 14/17
Technician:	Mach-
Project Number:	4-2252-04-02
Site Address:	Residence I

Starting Meteorological Parameters:

Outdoor Barometric Pressure:	101.8	Indoor Barometric Pressure:	105.5
Outdoor Temperature:	-13°C (-21WC)	Indoor Temperature:	20°C
Relative Humidity of Sampling Environment:	40%	Wind Direction & Speed:	18Km/W South

Ending Meteorological Parameters:

Outdoor Barometric Pressure:	100.7	Indoor Barometric Pressure:	105.4
Outdoor Temperature:	1°C	Indoor Temperature:	21°C
Relative Humidity of Sampling Environment:	457.	Wind Direction & Speed:	DEMIN

Trip Blank Canister Number:	
Location of Duplicate Sample:	
Canister Number(s):	Regulator Number:

PSI conducted Nera/17no changes.

13

In off ground in middle of laundry, furnace room. Door to restof beservent/house open.

Lab Identifier:	Residence I						
Canister Number(s):	14530	\supset		Regulator N	lumber	: 9-	12
Starting PID readings- 5 in 1 minute:	R	١		١	6	2	١
Start Time:	10:34	Γ	Starti	ing Canister Vac	uum:	-20	7.0
Ending PID readings- 5 in 1 minute:	١	١		١	6,	2	1
End Time:	1050		Endin	ng Canister Vacu	ium:	- 8	.0

Sample Height:	~Im on chair
Description of Sample Location (ie. room, position within a building, exit number, building number, etc):	in middle of laundrys Furnace room
HVAC conditions during sampling:	Type: <u>forced</u> air <u>/(On)</u> (Off)
Description of doors and windows and their usage (open, closed, high traffic through the doors, ie. how many times opened and closed in an hour)	minimal. Residents away overnight.

$$CH_{4}$$
 0.0
 Co_{2} 0.1
 O_{2} 20.5
 $7.1\pm 0.$

*a**

Date:	Mar 13/17 - Mar 14/17
Technician:	MCL
Project Number:	4-2352-04-03
Site Address:	Résidence J

Starting Meteorological Parameters:

Outdoor Barometric	1-10	Indoor Barometric	1-511
Pressure:	101.0	Pressure:	10 J.T.
Outdoor	1000 (010, 1)	Indoor Temperature:	0.000
Temperature:	-13C (-di WG		de
Relative Humidity of		Wind Direction & Speed:	R- MA
Sampling	4-11		Jarrahue
Environment:	.01.		IDENIW

Outdoor Barometric Pressure:	100.7	Indoor Barometric Pressure:	105.4
Outdoor Temperature:	1°C	Indoor Temperature:	21°C
Relative Humidity of Sampling Environment:	42%	Wind Direction & Speed:	SSE 12Km/hr

Trip Blank Canister Number:		
Location of Duplicate Sample:		
Canister Number(s):	Regulator Number:	<u>ــــــــــــــــــــــــــــــــــــ</u>

on ivoning board in middle of room, ~1.5m about floor in Furnace/ loundry

noom.



Lab Identifier:	Residence	J		۸ ٦ <i>١</i>			
Canister Number(s):	2813			Regulator N	lumber	: 16	· 6
Starting PID readings- 5 in 1 minute:	1	١		2		l	Q
Start Time:	10:49		Start	ing Canister Va	cuum:	-28	3.0
Ending PID readings- 5 in 1 minute:	١	١		ર	a		2
End Time:	11:00		Endi	ng Canister Vacı	um:	-9	. 0

Sample Height:	an imaginal management
	orritoring and a NI. Sm
Description of Sample Location (ie.	
room, position within a building, exit	imaale of laundry
number, building number, etc):	-Furnace room (beschert)
HVAC conditions during sampling:	
	Type: <u>forced</u> air
	(On)(Off)
Description of doors and windows	Daiaiana
and their usage (open, closed, high	inginin and
traffic through the doors, ie. how	
many times opened and closed in an	
hour)	

CH4 0.0 02 20.9 Co2 0.1).LEL 0

.





ATTACHMENT D LABORATORY CERTIFICATE OF ANALYSIS



Your Project #: 4-2352-04-03 Your C.O.C. #: 30583

Attention:Mary-Catherine Lanning

XCG Consulting Limited 820 Trillium Dr Kitchener, ON N2R 1K4

> Report Date: 2017/04/10 Report #: R4420991 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B752696

Received: 2017/03/16, 10:00

Sample Matrix: AIR # Samples Received: 12

		Date	Date		
Analyses	Quantity	Extracted	Analyzed	Laboratory Method	Reference
Canister Pressure (TO-15)	12	N/A	2017/03/30	BRL SOP-00304	EPA TO-15 m
Matrix Gases (1)	12	N/A	2017/04/06	CAM SOP-00225	
VOCs in Air (TO-15)	12	N/A	2017/03/30	BRL SOP-00304	EPA TO-15 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

(1) Argon interferes with

in the reported Oxygen concentration. The atmosphere contains about 0.9% Argon.

Encryption Key

Marinela Sim Project Manager 10 Apr 2017 16:47:51

Please direct all question Marinela Sim, Project Manager Email: MSim@maxxam.ca Phone# (905) 817-5700 ate of Analysis to your Project Manager.

MSin

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



XCG Consulting Limited Client Project #: 4-2352-04-03 Sampler Initials: MCL

RESULTS OF ANALYSES OF AIR

Aaxxam ID		EBG194	EBG195	EBG196	EBG197	
ampling Date		2017/03/14	2017/03/14	2017/03/14	2017/03/14	
OC Number		30583	30583	30583	30583	-
	UNITS	Residence B /T21636	Residence H /18260	Residence C /14258	Residence A'/27	58 QC Batch
olatile Organics			*****			
ressure on Receipt	psig	(-5.0)	(-3.6)	(-4.5)	(-3.9)	4920443
QC Batch = Quality Control B	Batch					
Maxxam ID		EBG198	EBG199	EBG200	EBG201	
Sampling Date		2017/03/14	2017/03/14	2017/03/14	2017/03/14	
COC Number		30583	30583	30583	30583	
	UNITS	Residence G /14531	Residence F /14918	Residence E/129	Residence D/18232	QC Batch
Volatile Organics						
Pressure on Receipt	psig	(-4.0)	(-4.0)	(-4.5)	(-4.6)	4920443
QC Batch = Quality Contr	ol Batch			······		

Maxxam ID		EBG202	EBG203	EBG204	EBG205	
Sampling Date		2017/03/14	2017/03/14	2017/03/14	2017/03/14	
COC Number		30583	30583	30583	30583	
	UNITS	Residence I/14530	Residence J /2813	OAQ/2595	XCG-300/2580	QC Batch
Volatile Organics		******				
Pressure on Receipt	psig	(-4.5)	(-4.3)	(-2.2)	(-4.5)	4920443
QC Batch = Quality Contro	l Batch					



Report Date: 2017/04/10

XCG Consulting Limited Client Project #: 4-2352-04-03 Sampler Initials: MCL

COMPRESSED GAS PARAMETERS (AIR)

Mayyam ID		T T			T								
			EBG1	94		EBG19	5	EI	BG19	6			
Sampling Date			2017/0	3/14		2017/03	/14	201	7/03,	/14			
COC Number		30583				30583	3	3	30583	i			
		UNITS	UNITS Residence B/T21636			Residence H /18260		Resid	ence	C/14258	RDL	QC Bat	tch
Fixed Gases													
Methane		% v/v	<0.2	2		<0.2	I		<0.2		0.2	49300	64
RDL = Reportable D	etection l	limit							******		L		
QC Batch = Quality	Control B	atch											
Maxxam ID			EBG19	7		EBO	5198		EBG	199			
Sampling Date			2017/03,	/14		2017	/03/14	2	017/0)3/14			
COC Number			30583			30	583		305	83			
		UNITS	Residenc	e A/2758	RDL	Reside	ence G 14531	Residence F /14918		RDL	QC Ba	atch	
Fixed Gases													
Methane		% v/v	<0.1		0.1	<	0.2		<0.	.2	0.2	4930	064
QC Batch = Quality C	ontrol Ba	tch											
am ID		E	BG200	EB	G20	01	EB	G202		EBG20	3		
am ID ling Date		E 20:	BG200 17/03/14	EB 2017	3G20 7/03	01 3/14	EB 2017	G202 7/03/14		EBG20 2017/03	3 /14		
am ID Iling Date Number		E 20:	BG200 17/03/14 30583	EB 2017 3	G20 7/03	01 3/14 33	EB 2017 3(G202 7/03/14 0583		EBG20 2017/03 30583	3 /14 }		
am ID Iling Date Number	UNITS	E 20: Res	BG200 17/03/14 30583 idence E '/129	EB 2017 3 Reside	3G20 7/03 058	01 3/14 33 e D /18232	EB 2017 30 Resider	G202 7/03/14 0583 nce I /1453	0 R	EBG20 2017/03 30583 Residence	3 /14 3 J /281 3	3 RDL	QC
am ID Iling Date Number Gases	UNITS	E 201 Res	BG200 17/03/14 30583 idence E '/129	EB 2017 30 Reside	3G2(7/03 058	01 3/14 33 e D /18232	EB 2017 30 Resider	G202 //03/14 0583 nce I /1453	0 R	EBG20 2017/03 30583 esidence	3 /14 3 J /281 1	3 RDL	QC
am ID ling Date Number Gases ane	UNITS	E 20: Res	BG200 17/03/14 30583 idence E /129 <0.2	EB 2017 3 Reside	3G20 7/03 058 ence <0.2	01 3/14 33 € D /18232	EB 2017 30 Resider	G202 7/03/14 0583 ace I /1453	0 R	EBG20 2017/03 30583 Residence - <0.2	3 /14 3 J /281 1	B RDL	QC
am ID ling Date Number Gases ane Reportable Detection atch = Quality Control	UNITS % v/v a Limit Batch	E 20: Res	BG200 17/03/14 30583 idence E /129	EB 2017 3 Reside	3G2(7/03 058 ence <0.2	01 3/14 33 e D /18232	EB 2017 30 Resider	G202 7/03/14 0583 nce I /1453 0.2	0 R	EBG20 2017/03 30583 Residence - <0.2	3 /14 3 J /281 3	3 RDL	QC
am ID ling Date Number Gases ane Reportable Detection atch = Quality Control	UNITS WV/V Limit Batch	Res	:BG200 17/03/14 30583 idence E' /129 <0.2	EBG204	3G2(7/03 058 ence <0.2	01 3/14 3 2 D' /18232 2 EBG205	EB 2017 3(Resider	G202 7/03/14 0583 nce I /1453 0.2	0 8	EBG20 2017/03 30583 eesidence - <0.2	3 /14 3 J /281 :	3 RDL	QC
am ID ling Date Number Gases ane Reportable Detection atch = Quality Control I Max Sam	UNITS W/V Limit Batch xam ID pling Date	e	BG200 17/03/14 30583 idence E'/129 <0.2	EBG204 2017/03/14	3G2(7/03 058 ence <0.2	01 3/14 3 D' 18232 2 EBG205 2017/03/1-	EB 2017 3(Resider < < EE 4 201	G202 7/03/14 0583 ace I /1453 0.2 0.2 3G205 7/03/14	0 R	EBG20 2017/03 30583 cesidence - <0.2	3 /14 3 J/281:	3 RDL	QC
am ID ling Date Number Gases ane Reportable Detection atch = Quality Control I Max Sam COC	UNITS UNITS W/v/v Limit Batch Xam ID pling Data Number	e	BG200 17/03/14 30583 idence E' /129 <0.2	EBG204 2017/03/14 2017/03/14	3G20 7/03 0058 ence <0.2	01 3/14 3 D' /18232 2 EBG205 2017/03/14 30583	EB 2017 3(Resider <	G202 7/03/14 0583 nce I /1453 0.2 0.2 3G205 7/03/14 0583	0 R	EBG20 2017/03 30583 Residence	3 /14 3 J/281:	3 RDL	QC
am ID ling Date Number Gases ane Reportable Detection atch = Quality Control Max Sam COC	UNITS UNITS % v/v Limit Batch xam ID pling Dato Number	e	BG200 17/03/14 30583 idence E'/129 <0.2	EBG204 2017/03/14 2017/03/14 30583 OAQ/2595	3G20 7/03 058 ence <0.2	01 3/14 3 ⇒ D' /18232 2 EBG205 2017/03/14 30583 (CG-300/25)	EB 2017 3(Resider 4 201 4 201 380 XCG-3 La	G202 //03/14 0583 ince I /1453 0.2 0.2 3G205 7/03/14 0583 300/2580 b-Dup	0 RDL	EBG20 2017/03 30583 desidence . <0.2	3 /14 3 J/281:	0.2	QC
am ID ling Date Number Gases ane Reportable Detection atch = Quality Control Max Sam COC	UNITS With View of the second	e	BG200 17/03/14 30583 idence E'/129 <0.2	EBG204 2017/03/14 2017/03/14 30583 OAQ/2595	3G2(7/03 058 ence <0.2	01 3/14 3 D/18232 2 EBG205 2017/03/14 30583 (CG-300/25	EB 2017 30 Resider < < < 4 201 4 201 3 80 XCG-3 La	G202 7/03/14 0583 ince I/1453 0.2 0.2 3G205 7/03/14 0583 300/2580 b-Dup	0 RDL	EBG20 2017/03 30583 esidence - <0.2	3 /14 3 JJ/281:	0.2	QC
am ID ling Date Number Gases ane Reportable Detection atch = Quality Control Max: Sam COC Fixed Meth	UNITS UNITS W/v Limit Batch Xam ID pling Dato Number d Gases hane	e	BG200 17/03/14 30583 idence E'/129 <0.2 <0.2 UNITS	EBG204 2017/03/14 2017/03/14 30583 OAQ/2595	3G2(7/03 058 ence <0.2	01 3/14 3 ⇒ D' /18232 2 EBG205 2017/03/14 30583 (CG-300/25 <0.2	EB 2017 3(Resider <	G202 //03/14 0583 ince I/1453 0.2 0.2 3G205 7/03/14 0583 300/2580 b-Dup <0.2	0 R 0 R RDL	EBG20 2017/03 30583 eesidence . <0.2 <0.2 QC Batch	3 /14 3 J/281:	0.2	QC



XCG Consulting Limited Client Project #: 4-2352-04-03 Sampler Initials: MCL

VOLATILE ORGANICS BY GC/MS (AIR)

Maxxam ID		EBG194			EBG195				
Sampling Date		2017/03/14			2017/03/14			1	
COC Number		30583			30583	1	1	1	1
	UNITS	Residence B/T2163	6 ug/1	m3 DL (ug/m3)	Residence H /18260	RDL	ug/m3	DL (ug/m3)	QC Batch
Volatile Organics									
Vinyl Chloride	ppbv	<0.02	<0.0	0.051 0.051	<0.02	0.02	<0.051	0.051	4920442
cis-1,2-Dichloroethylene	ppbv	<0.05	<0.	20 0.20	<0.05	0.05	<0.20	0.20	4920442
Surrogate Recovery (%)									
Bromochloromethane	%	89	N/	A N/A	90		N/A	N/A	4920442
D5-Chlorobenzene	%	91	N/	A N/A	85		N/A	N/A	4920442
Difluorobenzene	%	86	N/	A N/A	83		N/A	N/A	4920442
QC Batch = Quality Control B N/A = Not Applicable	atch								
Maxxam ID		EBG195			EBG196				
Sampling Date		2017/03/14			2017/03/14				
COC Number		30583			30583				
	UNITS	Residence H /18260 v Lab-Dup	ug/m3	DL (ug/m3)	Residence Ci /14258	RDL	ug/m3	DL (ug/m3)	QC Batch
Volatile Organics				te e en de la decimienta de constituide (e positificante de Vielantes	44				
Vinyl Chloride	ppbv	<0.02	<0.051	0.051	<0.02	0.02	<0.051	0.051	4920442
cis-1,2-Dichloroethylene	ppbv	<0.05	<0.20	0.20	<0.05	0.05	<0.20	0.20	4920442
Surrogate Recovery (%)									
Bromochloromethane	%	86	N/A	N/A	83		N/A	N/A	4920442
D5-Chlorobenzene	%	81	N/A	N/A	80		N/A	N/A	4920442
Difluorobenzene	%	79	N/A	N/A	78		N/A	N/A	4920442
RDL = Reportable Detection QC Batch = Quality Control B	Limit Batch								
Lab-Dup = Laboratory Initiat	ed Dupli	cate							

N/A = Not Applicable



Report Date: 2017/04/10

XCG Consulting Limited Client Project #: 4-2352-04-03 Sampler Initials: MCL

VOLATILE ORGANICS BY GC/MS (AIR)

Maxxam ID		EBG197			EBG198				
Sampling Date		2017/03/14			2017/03/14				
COC Number		30583			30583				
	UNITS	Residence A/2758	ug/m3	B DL (ug/m3)	Residence G /14531	RDI	L ug/m3	B DL (ug/m3) QC Batch
Volatile Organics									
Vinyl Chloride	ppbv	<0.02	<0.052	0.051	<0.02	0.0	2 <0.051	l 0.051	4920442
cis-1,2-Dichloroethylene	ppbv	<0.05	<0.20	0.20	<0.05	0.0	5 <0.20	0.20	4920442
Surrogate Recovery (%)									
Bromochloromethane	%	85	N/A	N/A	83		N/A	N/A	4920442
D5-Chlorobenzene	%	82	N/A	N/A	78		N/A	N/A	4920442
Difluorobenzene	%	79	N/A	N/A	78		N/A	N/A	4920442
RDL = Reportable Detection	Limit								
N/A = Not Applicable		ERG100		T	EBG200		I		
Someling Date		2017/02/14			2017/02/14				
COC Number		2017/03/14			2017/03/14				
	UNITS	Residence F /14918	ug/m3	DL (ug/m3)	Residence E/129	RDL	ug/m3	DL (ug/m3)	QC Batch
Volatile Organics									
Vinyl Chloride	ppbv	<0.02	<0.051	0.051	<0.02	0.02	<0.051	0.051	4920442
cis-1,2-Dichloroethylene	ppbv	<0.05	<0.20	0.20	<0.05	0.05	<0.20	0.20	4920442
Surrogate Recovery (%)						<u></u>			
Bromochloromethane	%	84	N/A	N/A	82		N/A	N/A	4920442
D5-Chlorobenzene	%	81	N/A	N/A	80		N/A	N/A	4920442
Difluorobenzene	%	78	N/A	N/A	76		N/A	N/A	4920442
RDL = Reportable Detection QC Batch = Quality Control N/A = Not Applicable	n Limit Batch								



Report Date: 2017/04/10

XCG Consulting Limited Client Project #: 4-2352-04-03 Sampler Initials: MCL

VOLATILE ORGANICS BY GC/MS (AIR)

Maxxam ID			EBG201			EBG202						
Sampling Date			2017/03/14			2017/03/	14					
COC Number			30583			30583						
U	JNITS	R	esidence D /18232	ug/m3	DL (ug/m3)	Residence I/	14530	RDL	ug/m3	DL (ug	g/m3)	QC Batch
Volatile Organics												
Vinyl Chloride	ppbv		<0.02	<0.051	0.051	<0.02		0.02	<0.051	0.0	51	4920442
cis-1,2-Dichloroethylene	ppbv		<0.05	<0.20	0.20	<0.05		0.05	<0.20	0.2	20	4920442
Surrogate Recovery (%)												
Bromochloromethane	%		82	N/A	N/A	81			N/A	N/	Ά	4920442
D5-Chlorobenzene	%		77	N/A	N/A	76			N/A	N/	Ά	4920442
Difluorobenzene	%		76	N/A	N/A	75			N/A	N/	Ά	4920442
Maxxam ID			EBG203	1		EBG204						
Sampling Date			2017/03/14			2017/03/14						
COC Number			30583			30583						
	1	UNITS	Residence J/2813	ug/m3	DL (ug/m3)	OAQ/2595	RDL	ug/m3	B DL (ug	(/m3)	QC Ba	tch
Volatile Organics												
Vinyl Chloride		ppbv	<0.02	<0.051	0.051	<0.02	0.02	<0.051	. 0.0	51	49204	42
cis-1,2-Dichloroethylene		ppbv	<0.05	<0.20	0.20	<0.05	0.05	<0.20	0.2	20	49204	42
Surrogate Recovery (%)												
Bromochloromethane		%	83	N/A	N/A	81		N/A	N/	'A	49204	42
D5-Chlorobenzene		%	80	N/A	N/A	74		N/A	N/	Ά	49204	42
Difluorobenzene		%	79	N/A	N/A	74		N/A	N/	Ά	49204	42
RDL = Reportable Detect QC Batch = Quality Contr N/A = Not Applicable	ion Lin rol Bat	nit ch										



XCG Consulting Limited Client Project #: 4-2352-04-03 Sampler Initials: MCL

VOLATILE ORGANICS BY GC/MS (AIR)

Maxxam ID		EBG205				
Sampling Date		2017/03/14				
COC Number		30583				
	UNITS	XCG-300/2580	RDL	ug/m3	DL (ug/m3)	QC Batch
Volatile Organics						
Vinyl Chloride	ppbv	<0.02	0.02	<0.051	0.051	4920442
cis-1,2-Dichloroethylene	ppbv	<0.05	0.05	<0.20	0.20	4920442
Surrogate Recovery (%)						
Bromochloromethane	%	80		N/A	N/A	4920442
D5-Chlorobenzene	%	75		N/A	N/A	4920442
Difluorobenzene	%	74		N/A	N/A	4920442
RDL = Reportable Detection L	imit					
QC Batch = Quality Control Ba	itch					
N/A = Not Applicable						



XCG Consulting Limited Client Project #: 4-2352-04-03 Sampler Initials: MCL

GENERAL COMMENTS

Matrix Gas Analysis: Canisters were pressurized with Helium to enable sampling. Results and DLs adjusted accordingly.

Matrix Gas Analysis: Results normalized to 100% dry volume.

Results relate only to the items tested.



XCG Consulting Limited Client Project #: 4-2352-04-03 Sampler Initials: MCL

QUALITY ASSURANCE REPORT

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4920442	MM2	Spiked Blank	Bromochloromethane	2017/03/30		99	%	60 - 140
			D5-Chlorobenzene	2017/03/30		95	%	60 - 140
			Difluorobenzene	2017/03/30		95	%	60 - 140
			Vinyl Chloride	2017/03/30		94	%	70 - 130
			cis-1,2-Dichloroethylene	2017/03/30		93	%	70 - 130
4920442	MM2	Method Blank	Bromochloromethane	2017/03/30		99	%	60 - 140
			D5-Chlorobenzene	2017/03/30		86	%	60 - 140
			Difluorobenzene	2017/03/30		91	%	60 - 140
			Vinyl Chloride	2017/03/30	<0.02		ppbv	
			cis-1,2-Dichloroethylene	2017/03/30	<0.05		ppbv	
4920442	MM2	RPD [EBG195-01]	Vinyl Chloride	2017/03/30	NC		%	25
			cis-1,2-Dichloroethylene	2017/03/30	NC		%	25
4930064	VTH	Method Blank	Methane	2017/04/07	<0.1		% v/v	
4930064	VTH	RPD [EBG205-01]	Methane	2017/04/06	NC		%	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).



XCG Consulting Limited Client Project #: 4-2352-04-03 Sampler Initials: MCL

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Angel Guerrero, Team Leader, VOC Air

Tom Mitchell, B.Sc, Supervisor, Compressed Gases

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.