

"Preliminary Indoor Air Quality Investigation Report for Parkview Elementary School – Part 2"

PREPARED FOR School District 83

PREPARED BY Ivan Cheung

M.Sc.

REVIEWED BY Robin Van Driel

M.Sc., CIH, ROH, CRSP

SITE LOCATION 605 Parksville Street, Sicamous,

BC

REPORT DATE October 10, 2019

1. Introduction

VanDriel OHS Consulting ("VOHS") was retained by School District 83 to perform an indoor air quality investigation at Parkview Elementary (605 Parksville Street, Sicamous, BC). Due to a recent odour complaint by students and staff, the staff and students in the west wing of the school were relocated to the east side of the school. The odour was described as musty and similar to a wet basement smell or spoiled food. This was clarified once the maintenance staff and Manager of facilities and Grounds conducted a walkthrough to identify any remaining source of the odour found on the day of the odour complaint. After all cleaning efforts, the school district found traces of the odour remaining in the supply closet of the west wing and in the single-stall washroom in Room 2 (Kindergarten) with a broken toilet. The odour was also found on the new mops used to clean the school after the old mops were disposed of. Reported symptoms believed to have been caused by this odour included headaches and upper respiratory tract irritation.

Efforts to remove the source of the odour by the school district and remediation contractors included removal of all contents from classroom 4, isolating of the main entryway into the corridor of the west wing using polyethylene sheeting, and installation of humidifiers in the crawlspace under classroom 3, classroom 4, classroom 5 and the west corridor. By October 2, 2019, efforts also included the use of biocides to clean known areas with suspected mould growth.

2. Investigation Methodology

Two investigations were performed. The first investigation, conducted on September 19, 2019, utilized several methods to assess the indoor air quality of the school, as reported in "Preliminary Indoor Air Quality Investigation Report for Parkview Elementary School" and "Preliminary Report on Mould Culture Samples at Parkview Elementary". The focus of this investigation was on the west wing of the building for several potential indoor air quality contaminants with the exception of viable airborne mould spores which will be reported in a separate report once results are available. Informal interviews with the school Principal and Manager of Facilities and Grounds were held to obtain information on the odour and complaints reported by the occupants of the school.

The second investigation, conducted on October 2, 2019, utilized the same methods as the first investigation, in addition to the use of gas monitors, which were used to further assess the indoor air quality of the school. Unlike the previous investigation, efforts were made to mimic some of the conditions on the day of the incident when the odour was detected. This included not having the ventilation operational and having no occupants within the building.

2.1 Gaseous Contaminants

On October 2, 2019, a gas monitor, MultiRAE (RAE Systems, San Jose, CA), with a photoionization detector (PID) for detecting a variety of volatile organic compounds (VOCs) and sensors for nitrogen dioxide (NO $_2$), nitric oxide (NO), and sulfur dioxide (SO $_2$) was used. An additional gas monitor, GasAlert Max XTII (BW Technologies Ltd, Lincolnshire, IL), with sensors for hydrogen sulfide (H $_2$ S), carbon monoxide (CO), oxygen (O $_2$), and explosive gases measured as the lower explosive limit (LEL) was also utilized. These two gas monitors were carried by the VOHS representative while conducting a walkthrough of each section of the school building for approximately two hours. Once a similar odour as the one originally reported was detected by district representatives, these monitors were placed inside

areas for direct reading measurements. This occurred in the supply closet in the west wing and the east wing. The calibration certificate of the MultiRAE is available in Appendix B.

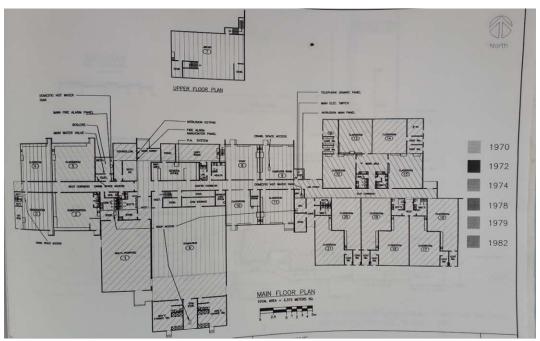


Figure 1: Not to Scale floor plan of Parkview Elementary.

As ambient air quality standards are very stringent for indoor air quality, a value above 10% of the WorkSafeBC Occupational Exposure Limits is used as an indicator of a source of these gases, except for carbon monoxide where (9 ppm) is used per indoor air quality guidelines. These values are listed in Table 1 for reference.

Table 1: Indicator concentration for indoor air contaminants.

Contaminant	Indicator concentration
Carbon monoxide (CO)	9.0 ppm
Nitric oxide (NO)	2.5 ppm
Nitrogen dioxide (NO ₂)	0.1 ppm
Hydrogen sulfide (H₂S)	1 ppm
Sulfur dioxide (SO₂)	0.2 ppm

2.2 Volatile Organic Compounds

On October 2, 2019, four 1.4 L evacuated gas canisters were placed in four locations throughout the school. The canisters had a regulator that maintained constant air flow into the canister for 240 minutes. The locations include:

1. the crawlspace entrance near the stockroom,

- 2. the east corridor,
- 3. room 16 (classroom), and
- 4. the supply closet in the west wing, where the odour of concern was reported to be strongest at the time of sampling.

The contents were analyzed by US Environmental Protection Agency (EPA) Method TO-15, which analyses the contents of the canister for a variety of volatile organic compounds (VOCs). The analysis involves putting the air through a gas chromatograph, which separates the gaseous components by their boiling point and mass, and a mass spectrometer, which blasts the gaseous components with ions. These two processes generate very identifying features specific to each molecule. The response related to these specific features can be correlated with a laboratory standard of known concentration to yield a concentration in the sampled air. A search of the library of 79 common VOCs known in the TO-15 method, along with a search of common indoor air contaminants for these identifying features was undertaken to determine which VOCs were present and the concentration within the gas canister. A total volatile organic compounds (TVOC) concentration is also computed by the summation of all known response peak and all unknown response peaks assuming that it has the same molecular weight as toluene.

The European Commission Report 19 entitled *Total volatile organic compounds (TVOC) in indoor air quality investigations* recommends a guideline limit of 300 $\mu g/m^3$. Above this level, there is likely to be some complaints of odour issues and respiratory irritation. Given the many VOCs in existence, there may be no effect that come about despite exceeding the guideline, but the limit of 300 $\mu g/m^3$ of TVOC is an indicator of a possible issue.

2.3 Tape Lift Mould Samples

On October 2, 2019, samples were collected based on the reported areas where remediation efforts were made or where mould growth was thought to have occurred. Tape lift samples included two water damaged areas in the west wing crawlspace and in the ceiling space above the central corridor.

2.4 Non-viable Airborne Mould Spore Samples

On October 2, 2019, spore samples were collected onto Air-o-Cell cassette. Air was drawn through the cassette using a Zefon Air-o-Cell Biosampler at a constant flow rate of 15 L/min. Samples were collected at the same locations where culturable mould samples were collected, which included the crawlspace, supply closet, the corridor, classroom, a ceiling space, and the office area for a total of 10 minutes. An outdoor sample was collected for comparison purposes. Fungal spores trapped in the Air-o-Cell cassette were counted and identified by their morphology at various locations of the Air-o-cell filter following the *American Society for Testing and Materials (ASTM) D7391 Standard*. Indoor samples were compared with the outdoor samples based on the count and morphology of spores. A determination of the amount of background particulate matter was also made, ranging from 1 (very low) to 5 (very high), to determine whether there are other substances that may be present in the environment. Appendix B shows the calibration certificate of the bio-sampler.

3. Results and Interpretation

Appendix D contains the laboratory results for VOC and mould tape and bulk samples. Appendix E contains the laboratory chain of custody forms. Appendix F contains the air sample data sheets.

3.1 Gaseous Contaminants

 NO_2 was detected between 0.1 to 0.3 ppm inside the school, while the outdoor concentration was 0.2 to 0.4 ppm. As NO_2 reacts slowly with water to form nitric acid (HNO₃), the amount of NO_2 eventually decreases from the environment. Therefore, the source of the NO_2 within the school does not come from a source inside the school.

NO, CO, H_2S and SO_2 were not detected at any time throughout sampling above 0.5 ppm, 9.0 ppm, 0.5 ppm, and 0.05 ppm respectively. O_2 was around 20.9%. The VOC sensor did not detect anything above 0.5 ppm, or 1800 $\mu g/m^3$ as toluene equivalent VOCs at 25 °C and 101.325 kPa. The LEL sensor did not detect any explosive material reaching above 0.5% of the LEL. Therefore, there was no significant source of these gaseous contaminants in the school.

3.2 Volatile Organic Compounds

The VOCs detected in the gas canisters are listed in Table 2.

Table 2: Known Volatile organic compounds detected in the west wing corridor of Parkview Elementary in parts per billion (ppb).

VOC (ppb)	East corridor	Crawlspace under stockroom	Supply Closet	Classroom
Acetone	4.3	4.9	8.5	5.9
Benzaldehyde	1.1			1.0
n-Butane	0.87	1.1	4.0	1.5
Chloromethane	0.51	0.65		
Cyclohexane, butyl-			1.1	
Cyclohexane, propyl-		1.9		
Decane	1.8	2.3	4.6	1.4
Decane, 4-methyl-	1.0			
Ethane, 1,1-dichloro-1-fluoro-	1.9	1.5	1.0	3.5
Ethane, 1,1-difluoro				1.0
Ethanol	7.7	19	11	12
Ethyl acetate		0.57		
Freon 12 (dichlorodifluoromethane)	5	0.55	2.1	10
Isopropyl alcohol	5.9	5.8	8.8	5.2

VOC (ppb)	East corridor	Crawlspace under stockroom	Supply Closet	Classroom
Nonane	1.0		1.5	
Nonane, 4-methyl-	3.6			
Pentane	2.5		6.7	1.8
Propane			3.2	
Toluene			0.72	
Undecane			1.2	
Xylene				1.1
Total VOC (μg/m³)	140	100	210	150

Unknown hydrocarbons with known molecular weight and retention time in the gas chromatograph are not listed.

On October 2, 2019, similar VOCs were detected at similar concentrations at the four other locations, suggesting that the products containing VOCs at the school were releasing these as vapors. The supply closet sample contained a few other unknown hydrocarbons, which are expected to be in the cleaning agents in the room. As the VOC amounts are all less than 300 μ g/m³, the exposure to these VOCs are not expected to contribute to the indoor air quality issue at the school.

Ethanol, acetone, isopropyl alcohol, and ethyl acetate are found as either solvents for products such as cleaning agents, personal care products, nail polish remover, some perfume/cologne. Chloromethane may off-gas from rubber and silicone products and may also be included as a refrigerant. Benzaldehyde is a preservative in some food products, cosmetics and degradable building materials, such as caulking. Based on TVOC readings, these are not likely to have caused any irritating symptoms.

Freon 12, 1,1-dichloro-1-fluoroethane, and 1,1-difluoroethane are used as refrigerant or heat exchange fluid but do not have observable adverse effect to human health at the identified concentration. It is not associated with respiratory irritation.

Toluene and xylene are used as a solvent in building materials, such as paints, paint thinner, adhesives. Pentane, propane, and butane are added as a solvent in some building materials, adhesives, and aerosolized personal care products (e.g.: shaving cream spray). Cyclohexanes are used in the production of or used in industrial processes for making lacquers, resins and synthetic rubber. Decane, undecane, and nonane are found in heavier fuels, such as diesel and jet fuel. These are associated with headache and nausea symptoms.

A surface conditioner for the self-adhesive membranes used for the new roof installation includes IKO self-adhering membrane adhesive. The components include hydrotreated light naphtha, acetone toluene, and solvent-refined heavy paraffinic petroleum distillate (See Appendix G for the safety data sheet). This accounts for the observed presence of acetone, propane, butane, pentane, cyclohexanes, nonanes, decanes, undecane, toluene, and xylene.

All VOCs identified correlate with products used in the recent roof replacement project, cleaning products onsite, and refrigerant slowly leaking.

3.3 Tape Lift Mould Samples

The results of the three tape lifts are listed in Table 3. The ceiling tape sample from the central section of the school identified spores from outdoor fungi, such as ascomycetes, basidiomycetes, and myxomycetes. There were also some *Cladosporium* spores as well, indicating that the area received air from outdoors.

Table 3: Spores identified on tape lifts on October 2, 2019 at Parkview Elementary.

Identified groups	Ceiling – Central section (B04)	Crawlspace – Concrete (B05)	Crawlspace – Wood (B06)
Ascospores	Rare	Rare	Rare
Aspergillus / Penicillium	None	Rare	None
Basidiospores	Rare	Low	Low
Chaetomium	None	Rare	None
Cladosporium	Rare	Rare	None
Hyphal fragment	None	Medium	Medium
Myxomycetes	Rare	Rare	None
Stachybotrys / Memnoniella	None	None	Rare

Rare = 1 to 10, Low = 11 to 100, Medium = 101 to 1000 counts/area analyzed.

In the crawlspace, the wet area by the sump tank pipe in the west wing and the drier area by the exposed plywood of the building envelope detected a large number of hyphal fragments, which is indicative of constant mould growth in the area. No spores were detected in high concentration on surfaces, though various outdoor fungi (*Stachybotrys*, *Cladosporium*, *Chaetomium*, *Aspergillus*, *Penicillium*, *Memnoniella*) were detected. When areas with nutrients for fungi (such as wood) do not dry up quick enough, it can become a suitable environment for mould growth. It is likely that the crawlspace is conducive to mould growth whenever the crawlspace becomes wet or damp.

3.4 Non-viable Airborne Mould Samples

Table 4 lists the spore concentrations at the various locations where samples were collected. The fungal spore concentration within indoor spaces is below the concentrations outside. The ratio of outdoor fungi spores and other spores are also similar, with ascospores and basidiospores (groups of fungi that can only grow in outdoor environments) comprising most of the spores. The exception is the supply closet in the east wing, which has a higher concentration of fungi spore than the outdoor samples. This is likely due to a lack of cleaning and an inward flow of materials from the hallway and entrance towards the closet.

Table 4: Spore concentration in count per cubic metre (count/m³) at various locations in Parkview Elementary.

Location	Total	Aspergillus / Penicillium	Cladosporium	Ascospores / Basidiospore	Other Outdoor Fungi	Background particles
Outdoor – East Entrance	13430	20	90	13220	100	Moderate
Outdoor – Main Entrance	9830	410	200	9140	80	Moderate
Ceiling – Central	3410	200	40	3170	0	Moderate
Ceiling – West	1827	200	0	1600	27	Low
Office Area	147	20	0	120	7	Low
Classroom 20	260	0	0	260	0	Low
Corridor – East	1600	90	20	1490	0	Moderate
Crawlspace under Stockroom	1700	100	60	1520	20	Moderate
Supply closet – West	940	260	0	680	0	Moderate
Supply closet – East	15310	0	100	15130	60	Moderate

Report Completed By:

Ivan Cheung, M.Sc.

Swanting

Occupational Hygiene Specialist

Report Reviewed By:

Robin Van Driel M.Sc., CIH, ROH, CRSP

Principal, Sr. Occupational Hygienist

(778) 879-8009 | robin@vohsgroup.com

Anna Rybczynski BSc., CRSP

OHS Consultant

Sun Bo.

(236) 838-8009 | anna@vohsgroup.com

Appendix A: Photos during Investigation



Exposed plywood of the building envelope on the west wall of the west wing as seen from the crawlspace.



Water stained fungal growth along the concrete wall of the crawlspace next to (and south of) the exposed plywood of the building envelope in the west wing.

Sample B05 contained ascospore,

Aspergillus/Penicillium spores,
basidiospores, Chaetomium spores,
Cladosporium spores, hyphal fragment,
and myxomycetes spores.



Wet wood by a pipe going through the building envelope in the west wing crawlspace. Sample B06 contained ascospore, basidiospores, hyphal fragment, and Stachybotrys/Memnoniella spores.



Damp dirt in the crawlspace under the stockroom after the water boiler was removed. Odour resembling *Penicillium* was detected from the damp dirt.



Water stained wood in the ceiling space above the central section of the school. Sample B04 contained ascospore, basidiospores, *Cladosporium* spores, and myxomycetes spores.

Appendix B: Calibration Certificate

Concept Controls certifies that the instrument specified herein has been inspected, tested and calibrated in accordance with the factory standards and specifications as outlined by the manufacturer. Equipment Type: RAE Systems MultiRAE Pro Date Calibrated: October 1, 2019 RENTAL RE02078 Unit programmed to requested specs Sensor RAW values tested/verified Sensor Pate code Expirations verified Sensor Date code Expirations verified Sensor Date code Expirations verified Sensor Pate tested within specs Sensor readings stated and charged Sensors readings stated Sensors Sen	ac	ntrols certifies that the	ne instrument specifie		
RENTAL ID: Parameters Special Requests Sensor RAW values tested/verified Logging interval (seconds): 60 Logging interval (seconds): 60 Logging interval (seconds): 60 Logging type (method): Avg Unit communicates wirelessly (if applicable): Pump flow rate tested within specs Battery has been tested and charged Equipment free of contaminants Sensor seadings stabilize Equipment free of contaminants Sensor seadings stabilize Sensor seadings Sensor		cordance with the fac	- mad direct apecine	d herein has been inspected, tested	and calibrated in
RENTAL ID: Parameters Special Requests Sensor RAW values tested/verified Sensor Date code/ Expirations verified Sensor Date code/ Expirations verified Unit programmed to requested specs Sensor Date code/ Expirations verified Unit communicates wirelessly (if applicable) Pump flow rate tested within specs Battery has been tested and charged Pump Flow faults accordingly Equipment free of contaminants Sensors readings stabilize Equipment free of contaminants Sensors readings stabilize Sensors predictations unless otherwise specifications Sensors problem Sens	Equipment Ty				
Parameters Special Requests			ms Multikae Pro	Date Calibrated: October	1, 2019
Unit programmed to requested specs		RE02078			
Unit programmed to requested specs					
Parameters/ Special Requests Unit programmed to requested specs Logging interval (seconds): 60 Sensor RAW values tested/verified Logging Type (method): Avg Pump flow rate tested within specs Pump flow rate tested within specs Pump flow rate tested within specs Battery has been tested and charged Sensors readings stabilize Equipment free of contaminants Parameters are set to an industry "default" standard or as per the manufacturers recommended specifications unless otherwise specified. Custom or requested specifications should be addressed at the time of rental booking. Calibration Gas Used: Calibration Passes Sppm Sulfur Dioxide (SO2) Pass Sppm Nitrogen Dioxide (NO2) Pass B81-1125-9 25ppm Nitro Oxide (NO2) Pass B81-1125-9 25ppm Nitro Oxide (NO3) Pass Pass Pass Pass-125-4 100ppm Isobutylene (C4H8) Pass F83-248-100-2 Pass Calibration recommended every 30 days. It is recommended that a bump test be performed before each day's use to verify instrument operation, as per manufacturer's specifications. Accessory Shipped Qty Out Qty In Accessory Shipped Qty Out Qty In Secure Carry Case Qperations Manual Accessory Shipped Qty Out Qty In Spane 'AA' cell battery Pack AC Power Supply Battery Rack Screwdinver AC Power Supply Battery Rack Calibration Tubing (optional) Battery Pack Calibration Tubing (optional) Calibration Fliter Calib					
Unit programmed to requested specs Logging Interval (seconds): 60 Logging Type (method): Avg Pump flow fact tested within specs Pump Flow faults accordingly Equipment free of contaminants Equipment free of contaminants Parameters are set to an industry "default" standard or as per the manufacturers recommended specifications unless otherwise specified. Custom or requested specifications should be addressed at the time of rental booking. Calibration Gas Used: Calibration Passes Sppm Nitrogen Dioxide (SO2) Pass Sppm Nitrogen Dioxide (NO2) Pass Sppm Nitrogen Dioxide (NO2) Pass Sel3-175-5-3 Sppm Nitrogen Dioxide (NO2) Pass Sel3-125-25-4 100ppm Isobutylene (C4H8) Pass F83-248-100-2 Pass Calibration recommended every 30 days. It is recommended that a bump test be performed before each day's use to verify instrument operation, as per manufacturer's specifications. Calibration Recommended every 30 days. It is recommended that a bump test be performed before each day's use to verify instrument operation, as per manufacturer's specifications. Calibration Recommended every 30 days. It is recommended that a bump test be performed before each day's use to verify instrument operation, as per manufacturer's specifications. Calibration Recommended every 30 days. It is recommended that a bump test be performed before each day's use to verify instrument operation, as per manufacturer's specifications. Calibration Recommended every 30 days. It is recommended that a bump test be performed before each day's use to verify instrument operation, as per manufacturer's specifications. Calibration Recommended every 30 days. It is recommended that a bump test be performed before each day's use to verify instrument operation, as per manufacturer's specifications. Calibration Recommended every 30 days. It is recommended that a bump test be performed before each day's use to verify instrument operation, as per manufacturer's specifications.	NOMBER.				
Logging interval (seconds): 60			Parameters/ S	pecial Requests	
Logging Type (method): Avg	Unit p	rogrammed to reque	ested specs 🗹	Sensor RAW values t	tested/verified
Pump Flow faults accordingly					Control of the Contro
Pump Flow faults accordingly			COLUMN TO THE REAL PROPERTY OF THE PARTY OF		-
Parameters are set to an industry "default" standard or as per the manufacturers recommended specifications unless otherwise specified. Custom or requested specifications should be addressed at the time of rental booking. **Calibration Gas Used:** Calibration Passes Cali gas Lot Number Sppm Sulfur Dioxide (SO2) Pass Sppm Nitrogen Dioxide (NO2) Pass Sppm Nitric Oxide (NO) Pass DBJ-125-9 25ppm Nitric Oxide (NO) Pass DBJ-125-25-4 100ppm Isobutylene (C4H8) Pass FBJ-248-100-2 Pass Calibration recommended every 30 days. It is recommended that a bump test be performed before each day's use to verify instrument operation, as per manufacturer's specifications. **Accessory Shipped** Qty Out Qty In Accessory Shipped** Qty Out Qty In Accessory Shipped** Secure Carry Case 1			The second secon		and the same of th
Calibration Gas Used: Calibration Passes Cali gas Lot Number Sppm Sulfur Dioxide (SO2) Sppm Nitrogen Dioxide (NO2) Pass Sppm Nitrogen Dioxide (NO2) Pass DBJ-175-5-3 Sppm Nitric Oxide (NO) Pass DBJ-125-9 25ppm Nitric Oxide (NO) Pass DBJ-125-25-4 100ppm Isobutylene (C4H8) Pass FBJ-248-100-2 Pass Calibration recommended every 30 days. It is recommended that a bump test be performed before each day's use to verify instrument operation, as per manufacturer's specifications. Calibration recommended every 30 days. It is recommended that a bump test be performed before each day's use to verify instrument operation, as per manufacturer's specifications. Calibration Passes DBJ-125-25-4 100ppm Isobutylene (C4H8) Pass Calibration Passes DBJ-125-25-4 100ppm Isobutylene (C4H8) Pass Calibration Passes DBJ-125-25-4 100ppm Isobutylene (C4H8) Pass Calibration Passes DBJ-125-25-4 100ppm Isobutylene each day's use to verify instrument operation, as per manufacturer's specifications. Calibration Passes DBJ-125-25-4 100ppm Isobutylene (C4H8) Pass Calibration Passes DBJ-125-25-4 100ppm Isobutylene each day's use to verify instrument operation, as per manufacturer's specifications. Calibration Passes DBJ-125-25-4 100ppm Isobutylene (C4H8) Pass Calibration Passes DBJ-125-25-4 100ppm Isobutylene (C4H8) Accessory Shipped Qty Out Qty In Calibration Passes Calibration Passes DBJ-125-2-3 DBJ-125-2-4 DBJ-125-2-	The state of the s				
Sppm Nitrogen Dioxide (NO2) 25ppm Nitric Oxide (NO) Pass D8J-125-25-4 100ppm Isobutylene (C4H8) Pass FBJ-248-100-2 Pass Calibration recommended every 30 days. It is recommended that a bump test be performed before each day's use to verify instrument operation, as per manufacturer's specifications. Accessory Shipped Qty Out Qty In Secure Carry Case Alkalline Battlery Pack Alkalline Battlery Pack AC Power Supply AC Power Supply Travel Charger Assembly USB Interface Cable Hydrophobic Filter Hydrophobic Filter All accessories have been verified prior to the rental item leaving the Concept Controls facility. Missing or damage	Cana				- LOC MUNICH
Travel Charger Assembly All accessories have been verified prior to the rental item leaving the Concept Controls facility. Missing or damages					
Pass Calibration recommended every 30 days. It is recommended that a bump test be performed before each day's use to verify instrument operation, as per manufacturer's specifications. Accessory Shipped Qty Out Qty In Accessory Shipped Qty Out Qty I Rechargeable Battery Pack 1					
Accessory Shipped Qty Out Qty In Accessory Shipped Qty Out Qty In Secure Carry Case 1 Rechargeable Battery Pack 1 Alkaline Battery Pack 1 Alkal		10000111	,	NAME OF TAXABLE PARTY OF TAXABLE PARTY.	
Accessory Shipped Qty Out Qty In Accessory Shipped Qty Out Qty In Secure Carry Case 1 Rechargeable Battery Pack 1 Alkaline Battery Pack 1 Alkal				fof the bar to the control of the co	
Accessory Shipped Qty Out Qty In Accessory Shipped Qty Out Qty I Secure Carry Case 1 Rechargeable Battery Pack 1 Alkaline Battery Pack 1 Alkaline Battery Pack 1 Alkaline Battery Pack 1 Alkaline	Calibration recon				before each day's use
Secure Carry Case 1					
Operations Manual 1	Accessor	y Shipped		Accessory Shipped	Qty out Qty II
Software USB (ProRAE Studio II) 1				and the second s	AND PERSONAL PROPERTY AND PERSONS ASSESSED.
Travel Charger Assembly 1			Control of the latest		the state of the s
Travel Charger Assembly 1				A CONTRACTOR OF THE PARTY OF TH	the same of the last of the la
USB Interface Cable 1		B (ProRAE Studio II)	101 -		AND DESCRIPTION OF THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER.
All accessories have been verified prior to the rental item leaving the Concept Controls facility. Missing or damages	Software US	B (ProRAE Studio II) AC Power Supply	MANUAL DAVISOR OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN	AND DESCRIPTION OF THE PARTY OF	tional) 1년년
	Software US	B (ProRAE Studio II) AC Power Supply el Charger Assembly	100	Extension Tubing (opt	AND DESCRIPTION OF THE PARTY OF
	Software US	B (ProRAE Studio II) AC Power Supply el Charger Assembly USB Interface Cable	1 0 0	Extension Tubing (opt	AND DESCRIPTION OF THE PARTY OF
	Software US Trav	B (ProRAE Studio II) AC Power Supply el Charger Assembly USB Interface Cable Hydrophobic Filter	190	Extension Tubing (opt	driver 100
	Software US Travi	B (ProRAE Studio II) AC Power Supply el Charger Assembly USB Interface Cable Hydrophobic Filter ave been verified pri	1	Extension Tubing (option Screw Screw leaving the Concept Controls facilities	driver 1 0 0
Printed by: Verified by:	Software US Travi	B (ProRAE Studio II) AC Power Supply el Charger Assembly USB Interface Cable Hydrophobic Filter ave been verified pri	1	Extension Tubing (option Screw Screw leaving the Concept Controls facilities	driver 1 🕜 🔾

KE	NTAL C	ALIBRAT.	ION CERTIFI	CATE
Concept Co	ntrols certifies tha	t the instrument specified	herein has been inspected, tested	and calibrated in
ac	cordance with the	factory standards and spe	ecifications as outlined by the manu	afacturer.
Equipment T	ype: B	Biopump Plus	Date Validated: October	1, 2019
RENTAL ID:	RE01772			
SERIAL NUMBER:				
		Parameters/ Spo	acial Requests	
	Equipment free of	f contaminants 🕝	eron stefanous	0
	Unit pas	sses inspection		8
				B
		H		
			er the manufacturers recommende s should be addressed at the time of	
otherwise :	specified. Custom	or requested specifications	s should be addressed at the time of	of rental booking.
otherwise :	specified. Custom	or requested specifications	s should be addressed at the time of	
otherwise :	specified. Custom	or requested specification:	s should be addressed at the time of ation Passes Cal ga	of rental booking.
otherwise :	specified. Custom	or requested specification:	s should be addressed at the time of ation Passes Cal ga	of rental booking.
otherwise :	specified. Custom	or requested specifications f: Calibra Not applicable	s should be addressed at the time of ation Passes Cal ga	of rental booking.
otherwise :	pration Gas Used	t: Calibra Not applicable 30 days. It is recommende	s should be addressed at the time of ation Passes Cal ga	of rental booking.
Calibration reco	mmended every 3	accommended specifications Calibra Calibra Not applicable 30 days. It is recommended instrument operation, as p	s should be addressed at the time of ation Passes Cal ga n/a	s Lot Number before each day's use
Calibration reco	mmended every 3 to verify it	accommended specifications Calibra Calibra Not applicable 30 days. It is recommended instrument operation, as possible as	ation Passes Cal ga	of rental booking.
Calibration reco	mmended every 3 to verify it Secure Carry Co Operators Man	accommended specifications Calibra Calibra Not applicable 30 days. It is recommended instrument operation, as possible as	ation Passes Cal ga	s Lot Number before each day's use
Calibration reco	mmended every 3 to verify it Secure Carry Co Operators Man Chan	ase 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ation Passes Cal ga	s Lot Number before each day's use
Calibration reco	mmended every 3 to verify it Secure Carry Co Operators Man	t: Calibra Not applicable 30 days. It is recommendenstrument operation, as p Qty Out Qty In tase 1	ation Passes Cal ga	s Lot Number before each day's use
Calibration reco	mmended every 3 to verify it Secure Carry Co Operators Man Chan	ase 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ation Passes Cal ga	s Lot Number before each day's use
Calibration reco	mmended every 3 to verify it Secure Carry Co Operators Man Chan	ase 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ation Passes Cal ga	s Lot Number before each day's use
Calibration reco	mmended every 3 to verify it Secure Carry Co Operators Man Flow calibrat	according to the second specifications of the second specifications of the second specifications of the second specifications of the second specification of the second sp	ation Passes Cal ga	er rental booking. Is Lot Number Defore each day's use
Calibration reco	mmended every 3 to verify if Secure Carry Co Operators Man Chan Flow calibrat	or requested specifications it: Calibra Not applicable 30 days. It is recommende instrument operation, as p Qty Out Qty In ase 1	ation Passes Cal gardy nyla The control of the time o	s Lot Number before each day's use Qty Out Qty In

Appendix D: Laboratory Results for VOCs, Tape and Bulk Mould Samples



EMSL Canada Inc.

4506 Dawson Street Burnaby, BC V5C 4C1 Phone/Fax: (604) 757-3158 / (604) 757-4731 http://www.EMSL.com / yancouverlab@EMSL.com Order ID: Customer ID: 691902541 55VAND29

Customer PO: Project ID:

Attn: Robin Van Driel

SD83

Proi:

VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8 Phone: Fax: (778) 879-8009

Collected: Received:

10/01/2019 10/02/2019

Analyzed:

1: 10/03/2019

Test Report: Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Swab Samples (EMSL Method MICRO-SOP-200)

Lab Sample					
Number	Client Sample ID	Location	Fungal Identification	Category	
691902541-0001	SW1	CRAWL SPACE DIRT	Hyphal Fragment	Rare	_

No discernable field blank was submitted with this group of samples.

Bipolaris++ = Bipolaris/Dreschlera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut
* = Sample contains fruiting structures and/or hyphae associated with the spores.
- Denotes Not Detected

 Category
 Count/area Analyzed

 Rare
 1 to 10

 Low
 11 to 100

 Medium
 101 to 1000

 High
 > 1000

myst

Nicole Yeo, Laboratory Manager or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report.

Samples analyzed by EMSL Canada Inc. Burnaby, BC CALA Accreditation #A3998

Initial report from: 10/03/2019 10:24:20

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com

Test Report DEVER2-7.50.2 Printed: 10/03/2019 10:24:20AM

Page 1 of 1



EMSL Canada Inc.

4506 Dawson Street, Burnaby, BC V5C 4C1 Phone/Fax: (604)757-3158 / (604)757-4731 http://www.EMSL.com_vancouverlab@EMSL.com EMSL Order #: 691902551 Customer ID: 55VAND29 Customer PO: Not Available

Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8 Phone: 778-879-8009 Fax: Not Available

Project: IAQ2

Date Collected: 10/2/2019 Date Received: 10/3/2019

Laboratory Report- Sample Summary

EMSL Sample ID.	Client Sample ID.	Start Sampling Date	Start Sampling Time
691902551-0001	1	10/2/2019	
691902551-0002	2	10/2/2019	
691902551-0003	3	10/2/2019	
691902551-0004	4	10/2/2019	

If "Preliminary Report" is displayed in the signature box; this indicates that there are samples that have not yet been analyzed, that are in a preliminary state, or that analysis is in progress but not completed at the time of report issue.

Report Date 10/7/2019 Report Revision R0

Revision Comments Initial Report

> Nicole Yeo, Laboratory Manager or other approved signatory

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The results are not blank corrected unless otherwise noted. Interpretation and use of test results are the responsibility of the client. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

Page 1 of 21



EMSL Canada Inc.

4506 Dawson Street, Burnaby, BC V5C 4C1 Phone/Fax: (604)757-3158 / (604)757-4731 http://www.EMSL.com vancouverlab@EMSL.com EMSL Order #: 691902551 Customer ID: 55VAND29 Customer PO: Not Available

Robin Van Driel Attn: VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

Phone: 778-879-8009 Fax: Not Available

Project: IAQ2

Date Collected: 10/2/2019 Date Received: 10/3/2019

Case Narrative

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

<u>Column</u> Restek RTX-502.2, 60m, 0.25mm ID, 1.4um

Concentrator Traps: Entech Dual Cold Traps: (1) 1/8" No Packing, (2) 1/8" Tenax.

Certified Gas standards were used for all analyses.

Sample Volumes:

Sample volume aliquots for this procedure are 250cc for indoor/ ambient air and 25cc for soil gas. Other volumes for sample dilutions are reflected on each result

Holding Times:

Standard holding times of 30 days were met for all samples

Sampling Pressures:

All samples were received at acceptable pressure/vacuum unless listed below.

Sample Dilutions:

Dilutions reported are designated by the sample # with a "DL" suffix resulting from initial analysis having compounds exceeding calibration as reported with an "E" qualifier. Ethanol and Isopropanol are not diluted for and may be reported with an "E" qualifier on the final result.

QA/QC criteria outside method specifications are listed below (if applicable)

Initial Calibration

All Initial Calibration criteria met method specification.

Initial Calibration Verification Standard (ICVS)- Second Source
ICVS met method specification with 70-130% recovery for 100% of compounds.

Laboratory Control Sample (LCS)

LCS met method specification with 70-130% recovery for 100% of compounds. (If the LCS does not meet criteria but any compounds which have recoveries >130% are not found in the samples, samples may be reported)

Continuing Calibration Verification Standard (CCVS)

CCVS met method specification with all compounds within 30% deviation.

Ending Calibration Verification Standard (ECVS)

ECVS met method specification with all compounds within 30% deviation.

Method Blanks (MB)

Method Blank met method specification

Reporting Limit Laboratory Control Samples (RLLCS)

RLLCS met method specification with 90% of compounds within the 60-140% recovery range. Individual compounds outside of the recovery range may be listed below.

Page 2 of 21 V129a Page 2 of 7 691902551-1 R0.xlsm



EMSL Canada Inc.

4506 Dawson Street, Burnaby, BC V5C 4C1 Phone/Fax: (604)757-3158 / (604)757-4731 http://www.EMSL.com vancouverlab@EMSL.com EMSL Order #: 691902551 Customer ID: 55VAND29 Customer PO: Not Available

Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Phone: 778-879-8009 Fax: Not Available

Vancouver, BC V6K 4R8

Date Collected: 10/2/2019

Project: IAQ2

Date Received: 10/3/2019

Case Narrative

<u>Manual Integration</u>: -Listed below if applicable. Before and after documentation provided in extended deliverable packages

The following data qualifiers that may have been reported with the data,

ND- Non Detect. This notation would be used in the results column in lieu of a "U" qualifier

- U- Compound was analyzed for but not detected at a listed and appropriately adjusted reporting level
- J- Estimated value reported below adjusted reporting limit for target compounds or estimating a concentration for TICs where a 1:1 response is assumed
- B- Compound found in associated method blank as well as in the sample.
- E- Estimated value exceeding upper calibration range of instrument. Ethanol and isopropyl alcohol are not specifically targeted to dilute within calibration range
- D- Compound reported from additional diluted analysis.
- N- indicates presumptive evidence of a compound based on library search match.

EMSL Analytical, Inc. certifies that this data package is in compliance with the terms and conditions of this contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer -readable data submitted on diskette has been authorized by the laboratory manager or his/her designee, as verified by the following signature.

If "Preliminary Report" is displayed in the signature box; this indicates that there are samples that have not yet been analyzed, that are in a preliminary state, or that analysis is in progress but not completed at the time of report issue.

Report Date Report Revision **Revision Comments** 10/7/2019 R₀ Initial Report

> Nicole Yeo, Laboratory Manager or other approved signatory



EMSL Canada Inc.

4506 Dawson Street, Burnaby, BC V5C 4C1 Phone/Fax: (604)757-3158 / (604)757-4731 http://www.EMSL.com vancouverlab@EMSL.com

EMSL Order #: 691902551 EMSL Sample #: 691902551-1 Customer ID: 55VAND29 Customer PO: Not Available

Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

Phone: 778-879-8009 Fax: Not Available Date Collected: 10/2/2019 Date Received: 10/3/2019

Sample ID: 1

Project: IAQ2 Analysis Initial

Analysis Date 10/04/2019 Analyst Init. TP

Lab File ID P7176.D

Canister ID HD2744

Sample Vol. 250 cc

Dil. Factor

Target Compound Results Summary

	19	T	Result	RL		Result	RL	
Target Compounds	CAS#	MW	ppbv	ppbv	Q	ug/m3	ug/m3	Comments
Propylene	115-07-1	42.08	ND	1.0	П	ND	1.7	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.9	10	0.50		50	2.5	
Freon 114(1,2-Dichlorotetrafluoroethan	76-14-2	170.9	ND	0.50		ND	3.5	
Chloromethane	74-87-3	50.49	ND	0.50	ш	ND	1.0	
n-Butane	106-97-8	58.12	1.5	0.50		3.6	1.2	
Vinyl chloride	75-01-4	62.50	ND	0.50	\Box	ND	1.3	
1,3-Butadiene	106-99-0	54.09	ND	0.50	Ш	ND	1.1	
Bromomethane	74-83-9	94.94	ND	0.50	П	ND	1.9	
Chloroethane	75-00-3	64.52	ND	0.50	П	ND	1.3	
Ethanol	64-17-5	46.07	12	0.50		23	0.94	
Bromoethene(Vinyl bromide)	593-60-2	106.9	ND	0.50		ND	2.2	
Freon 11(Trichlorofluoromethane)	75-69-4	137.4	ND	0.50		ND	2.8	
Isopropyl alcohol(2-Propanol)	67-63-0	60.10	5.2	0.50		13	1.2	
Freon 113(1,1,2-Trichlorotrifluoroethan	76-13-1	187.4	ND	0.50		ND	3.8	
Acetone	67-64-1	58.08	5.9	0.50		14	1.2	
1,1-Dichloroethene	75-35-4	96.94	ND	0.50		ND	2.0	
Acetonitrile	75-05-8	41.00	ND	0.50		ND	0.84	
Tertiary butyl alcohol(TBA)	75-65-0	74.12	ND	0.50	П	ND	1.5	
Bromoethane(Ethyl bromide)	74-96-4	108.0	ND	0.50		ND	2.2	
3-Chloropropene(Allyl chloride)	107-05-1	76.53	ND	0.50	П	ND	1.6	
Carbon disulfide	75-15-0	76.14	ND	0.50	П	ND	1.6	
Methylene chloride	75-09-2	84.94	ND	0.50	П	ND	1.7	
Acrylonitrile	107-13-1	53.00	ND	0.50		ND	1.1	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.15	ND	0.50		ND	1.8	
trans-1,2-Dichloroethene	156-60-5	96.94	ND	0.50		ND	2.0	
n-Hexane	110-54-3	86.17	ND	0.50		ND	1.8	
1,1-Dichloroethane	75-34-3	98.96	ND	0.50		ND	2.0	
Vinyl acetate	108-05-4	86.00	ND	0.50		ND	1.8	
2-Butanone(MEK)	78-93-3	72.10	ND	0.50		ND	1.5	
cis-1,2-Dichloroethene	156-59-2	96.94	ND	0.50		ND	2.0	
Ethyl acetate	141-78-6	88.10	ND	0.50		ND	1.8	
Chloroform	67-66-3	119.4	ND	0.50		ND	2.4	
Tetrahydrofuran	109-99-9	72.11	ND	0.50		ND	1.5	
1,1,1-Trichloroethane	71-55-6	133.4	ND	0.50		ND	2.7	
Cyclohexane	110-82-7	84.16	ND	0.50		ND	1.7	
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.2	ND	0.50		ND	2.3	
Carbon tetrachloride	56-23-5	153.8	ND	0.50		ND	3.1	
n-Heptane	142-82-5	100.2	ND	0.50		ND	2.0	
1,2-Dichloroethane	107-06-2	98.96	ND	0.50	\Box	ND	2.0	
Benzene	71-43-2	78.11	ND	0.50		ND	1.6	
Trichloroethene	79-01-6	131.4	ND	0.50		ND	2.7	
1,2-Dichloropropane	78-87-5	113.0	ND	0.50		ND	2.3	
Methyl Methacrylate	80-62-6	100.12	ND	0.50		ND	2.0	
Bromodichloromethane	75-27-4	163.8	ND	0.50		ND	3.3	
1,4-Dioxane	123-91-1	88.12	ND	0.50		ND	1.8	
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	ND	0.50		ND	2.0	

Page 4 of 21 Page 4 of 7 V129a 691902551-1_R0.xlsm



Project: IAQ2

EMSL Canada Inc.

4506 Dawson Street, Burnaby, BC V5C 4C1
Phone/Fax: (604)757-3158 / (604)757-4731
http://www.EMSL.com vancouverlab@EMSL.com

EMSL Order #: 691902551

EMSL Sample #: 691902551-1

Customer ID: 55VAND29

Customer PO: Not Available

Attn: Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

Sample ID: 1

 Analysis
 Analysis Date
 Analyst Init.
 Lab File ID
 Canister ID
 Sample Vol.
 Dil. Factor

 Initial
 10/04/2019
 TP
 P7176.D
 HD2744
 250 cc
 1

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
cis-1,3-Dichloropropene	10061-01-5	111.0	ND	0.50	~	ND	2.3	Comments
Toluene	108-88-3	92.14	ND	0.50		ND	1.9	
trans-1,3-Dichloropropene	10061-02-6	111.0	ND	0.50		ND	2.3	
1.1.2-Trichloroethane	79-00-5	133.4	ND	0.50		ND	2.7	
2-Hexanone(MBK)	591-78-6	100.1	ND	0.50		ND	2.0	
Z-nexanone(MBK) Tetrachloroethene	127-18-4	165.8	ND	0.50		ND	3.4	
Dibromochloromethane	127-10-4	208.3	ND	0.50		ND	4.3	
1.2-Dibromoethane	106-93-4	187.8	ND	0.50		ND	3.8	
Chlorobenzene	108-93-4	112.6	ND	0.50		ND	2.3	
					_		_	
Ethylbenzene	100-41-4	106.2	ND	0.50		ND	2.2	
Xylene (p,m)	1330-20-7	106.2	1.1	1.0		4.9	4.3	
Xylene (Ortho)	95-47-6	106.2	ND	0.50		ND	2.2	
Styrene	100-42-5	104.1	ND	0.50		ND	2.1	
Isopropylbenzene (cumene)	98-82-8	120.19	ND	0.50		ND	2.5	
Bromoform	75-25-2	252.8	ND	0.50		ND	5.2	
1,1,2,2-Tetrachloroethane	79-34-5	167.9	ND	0.50		ND	3.4	
4-Ethyltoluene	622-96-8	120.2	ND	0.50		ND	2.5	
1,3,5-Trimethylbenzene	108-67-8	120.2	ND	0.50		ND	2.5	
2-Chlorotoluene	95-49-8	126.6	ND	0.50		ND	2.6	
1,2,4-Trimethylbenzene	95-63-6	120.2	ND	0.50		ND	2.5	
1,3-Dichlorobenzene	541-73-1	147.0	ND	0.50		ND	3.0	
1,4-Dichlorobenzene	106-46-7	147.0	ND	0.50		ND	3.0	
Benzyl chloride	100-44-7	126.0	ND	0.50		ND	2.6	
1,2-Dichlorobenzene	95-50-1	147.0	ND	0.50		ND	3.0	
1,2,4-Trichlorobenzene	120-82-1	181.5	ND	0.50		ND	3.7	
Hexachloro-1,3-butadiene	87-68-3	260.8	ND	0.50		ND	5.3	
Naphthalene	91-20-3	128.17	ND	0.50		ND	2.6	
Total Target Compound Concent	trations:		36	ppbv		110	ug/m3	

 Surrogate
 Result
 Spike
 Recovery

 4-Bromofluorobenzene
 10
 10
 100%

Qualifier Definitions

ND = Non Detect

B = Compound also found in method blank.

E= Estimated concentration exceeding upper calibration range.

D= Result reported from diluted analysis.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

691902551-1_R0.xlsm V129a Page 5 of 21 Page 5 of 21



EMSL Canada Inc.

 EMSL Order #: 691902551

EMSL Sample #: 691902551-1

Customer ID: 55VAND29

Customer PO: Not Available

in: Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

Project: IAQ2

Sample ID: 1

<u>Analysis</u>	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	10/04/2019	TP	P7176.D	HD2744	250 cc	1

Tentatively Identified Compound Results Summary

Tentatively Identified Compounds	CAS#	MW(1)	Result ppbv	Q	Result ug/m3	Retention Time	Comments
							Comments
Ethane, 1,1-difluoro-	000075-37-6	66	1.0	JN	2.7	5.05	
Pentane	000109-66-0	72	1.8	JN	5.3	8.60	
1,1-Dichloro-1-fluoroethane	001717-00-6	116	3.5	JN	16	9.66	
unknown hydrocarbon		92	1.8	JN	6.7	26.57	
Decane	000124-18-5	142	1.4	JN	8.0	27.43	
Benzaldehyde	000100-52-7	106	1.0	JN	4.5	28.89	
	+						
	Total TIC Conce		11	ppbv	43	ug/m3	

Qualifier Definitions

- (1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.
- B = Compound also found in method blank.
- J= Estimated value based on a 1:1 response to internal standard.
- N= Presumptive evidence of compound based on library match.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

691902551-1_R0.xlsm V129a Page 6 of 21 Page 6 of 7



EMSL Canada Inc.

4506 Dawson Street, Burnaby, BC V5C 4C1 Phone/Fax: (604)757-3158 / (604)757-4731 http://www.EMSL.com vancouverlab@EMSL.com

EMSL Order #: 691902551 EMSL Sample #: 691902551-1 Customer ID: 55VAND29 Customer PO: Not Available

Phone:

Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

778-879-8009 Fax: Not Available Date Collected: 10/2/2019 Date Received: 10/3/2019

Project: IAQ2

Sample ID: 1

Analysis	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	10/04/2019	TP	P7176.D	HD2744	250 cc	1

Total Volatile Organic Compounds (TVOC) Summary

			Result	RL		Result	RL	
Target Compounds	CAS#	MW	ppbv	ppbv	Q	ug/m3	ug/m3	Comments
Freon 12(Dichlorodifluoromethane)	75-71-8	120.90	10	0.50		50	2.5	
n-Butane	106-97-8	58.12	1.5	0.50		3.6	1.2	
Ethanol	64-17-5	46.07	12	0.50		23	0.94	
Isopropyl alcohol(2-Propanol)	67-63-0	60.10	5.2	0.50		13	1.2	
Acetone	67-64-1	58.08	5.9	0.50		14	1.2	
Xylene (p,m)	1330-20-7	106.20	1.1	1.0		4.9	4.3	
Total Target Compound Concentrations:			36	ppbv		110	ug/m3	

Qualifier Definitions

B = Compound also found in method blank.

E= Estimated concentration exceeding upper calibration range.

D= Result reported from diluted analysis.

			Result			Result	Retention	
Tentatively Identified Compounds	CAS#	MW(1)	ppbv		Q	ug/m3	Time	Comments
Ethane, 1,1-difluoro-	000075-37-6	66	1.0		JN	2.7	5.05	
Pentane	000109-66-0	72	1.8		JN	5.3	8.6	
1,1-Dichloro-1-fluoroethane	001717-00-6	116	3.5		JN	16	9.66	
unknown hydrocarbon		92	1.8		JN	6.7	26.57	
Decane	000124-18-5	142	1.4		JN	8.0	27.43	
Benzaldehyde	000100-52-7	106	1.0		JN	4.5	28.89	
	Total TIC Conce	entrations:	11	ppbv		43	ug/m3	

Qualifier Definitions
(1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.

B = Compound also found in method blank.

J= Estimated value based on a 1:1 response to internal standard.

N= Presumptive evidence of compound based on library match.

Total Volatile Organic Compounds (TVOCs): 150 ppbv ug/m3



4506 Dawson Street, Burnaby, BC V5C 4C1 Phone/Fax: (604)757-3158 / (604)757-4731

Customer ID: 55VAND29 Customer PO: Not Available http://www.EMSL.com vancouverlab@EMSL.com Phone: 778-879-8009 Fax: Not Available

Attn: Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

Date Collected: 10/2/2019 Date Received: 10/3/2019

EMSL Order #: 691902551

EMSL Sample #: 691902551-2

Project: IAQ2 Sample ID: 2

Analysis	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	10/04/2019	TP	P7177.D	HD2787	250 cc	1

Target Compound Results Summary

	ı arg	Target Compound Results Summary											
Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments					
Propylene	115-07-1	42.08	ND	1.0		ND	1.7						
Freon 12(Dichlorodifluoromethane)	75-71-8	120.9	5.0	0.50		25	2.5						
Freon 114(1,2-Dichlorotetrafluoroethan	76-14-2	170.9	ND	0.50		ND	3.5						
Chloromethane	74-87-3	50.49	0.51	0.50		1.0	1.0						
n-Butane	106-97-8	58.12	0.87	0.50		2.1	1.2						
Vinyl chloride	75-01-4	62.50	ND	0.50		ND	1.3						
1.3-Butadiene	106-99-0	54.09	ND	0.50	\vdash	ND	1.1						
Bromomethane	74-83-9	94.94	ND	0.50	Н	ND	1.9						
Chloroethane	75-00-3	64.52	ND	0.50	П	ND	1.3						
Ethanol	64-17-5	46.07	7.7	0.50		14	0.94						
Bromoethene(Vinyl bromide)	593-60-2	106.9	ND	0.50		ND	2.2						
Freon 11(Trichlorofluoromethane)	75-69-4	137.4	ND	0.50		ND	2.8						
Isopropyl alcohol(2-Propanol)	67-63-0	60.10	5.9	0.50		15	1.2						
Freon 113(1,1,2-Trichlorotrifluoroethan	76-13-1	187.4	ND	0.50		ND	3.8						
Acetone	67-64-1	58.08	4.3	0.50		10	1.2						
1.1-Dichloroethene	75-35-4	96.94	ND	0.50		ND	2.0						
Acetonitrile	75-05-8	41.00	ND	0.50		ND	0.84						
Tertiary butyl alcohol(TBA)	75-65-0	74.12	ND	0.50		ND	1.5						
Bromoethane(Ethyl bromide)	74-96-4	108.0	ND	0.50	Н	ND	2.2						
3-Chloropropene(Allyl chloride)	107-05-1	76.53	ND	0.50	\vdash	ND	1.6						
Carbon disulfide	75-15-0	76.14	ND	0.50		ND	1.6						
Methylene chloride	75-09-2	84.94	ND	0.50		ND	1.7						
Acrylonitrile	107-13-1	53.00	ND	0.50	\vdash	ND	1.1						
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.15	ND	0.50		ND	1.8						
trans-1,2-Dichloroethene	156-60-5	96.94	ND	0.50		ND	2.0						
n-Hexane	110-54-3	86.17	ND	0.50	\vdash	ND	1.8						
1,1-Dichloroethane	75-34-3	98.96	ND	0.50		ND	2.0						
Vinvl acetate	108-05-4	86.00	ND	0.50	Н	ND	1.8						
2-Butanone(MEK)	78-93-3	72.10	ND	0.50		ND	1.5						
cis-1,2-Dichloroethene	156-59-2	96.94	ND	0.50		ND	2.0						
Ethyl acetate	141-78-6	88.10	ND	0.50	П	ND	1.8						
Chloroform	67-66-3	119.4	ND	0.50		ND	2.4						
Tetrahydrofuran	109-99-9	72.11	ND	0.50	П	ND	1.5						
1,1,1-Trichloroethane	71-55-6	133.4	ND	0.50		ND	2.7						
Cyclohexane	110-82-7	84.16	ND	0.50		ND	1.7						
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.2	ND	0.50	П	ND	2.3						
Carbon tetrachloride	56-23-5	153.8	ND	0.50		ND	3.1						
n-Heptane	142-82-5	100.2	ND	0.50	П	ND	2.0						
1,2-Dichloroethane	107-06-2	98.96	ND	0.50	П	ND	2.0						
Benzene	71-43-2	78.11	ND	0.50	П	ND	1.6						
Trichloroethene	79-01-6	131.4	ND	0.50	П	ND	2.7						
1,2-Dichloropropane	78-87-5	113.0	ND	0.50	П	ND	2.3						
Methyl Methacrylate	80-62-6	100.12	ND	0.50		ND	2.0						
Bromodichloromethane	75-27-4	163.8	ND	0.50	П	ND	3.3						
1.4-Dioxane	123-91-1	88.12	ND	0.50	\Box	ND	1.8						
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	ND	0.50		ND	2.0						

Page 8 of 21 V129a Page 1 of 4 691902551-2_R0.xlsm



EMSL Canada Inc.

4506 Dawson Street, Burnaby, BC V5C 4C1 Phone/Fax: (604)757-3158 / (604)757-4731 http://www.EMSL.com_vancouverlab@EMSL.com

EMSL Order #: 691902551 EMSL Sample #: 691902551-2 Customer ID: 55VAND29 Customer PO: Not Available

Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

778-879-8009 Fax: Not Available Date Collected: 10/2/2019 Date Received: 10/3/2019

Project: IAQ2

Sample ID: 2

<u>Analysis</u> Initial	Analysis Date 10/04/2019	Analyst Init. TP	Lab File ID P7177.D	Canister ID HD2787	Sample Vol. 250 cc	<u>Dil. Factor</u> 1

Target Compound Results Summary

			Result	RL		Result	RL	
Farget Compounds	CAS#	MW	ppbv	ppbv	Q	ug/m3	ug/m3	Comments
cis-1,3-Dichloropropene	10061-01-5	111.0	ND	0.50		ND	2.3	
Toluene	108-88-3	92.14	ND	0.50		ND	1.9	
trans-1,3-Dichloropropene	10061-02-6	111.0	ND	0.50		ND	2.3	
1,1,2-Trichloroethane	79-00-5	133.4	ND	0.50		ND	2.7	
2-Hexanone(MBK)	591-78-6	100.1	ND	0.50		ND	2.0	
Tetrachloroethene	127-18-4	165.8	ND	0.50		ND	3.4	
Dibromochloromethane	124-48-1	208.3	ND	0.50		ND	4.3	
1,2-Dibromoethane	106-93-4	187.8	ND	0.50		ND	3.8	
Chlorobenzene	108-90-7	112.6	ND	0.50		ND	2.3	
Ethylbenzene	100-41-4	106.2	ND	0.50		ND	2.2	
Xylene (p,m)	1330-20-7	106.2	ND	1.0		ND	4.3	
Xylene (Ortho)	95-47-6	106.2	ND	0.50		ND	2.2	
Styrene	100-42-5	104.1	ND	0.50		ND	2.1	
Isopropylbenzene (cumene)	98-82-8	120.19	ND	0.50		ND	2.5	
Bromoform	75-25-2	252.8	ND	0.50		ND	5.2	
1,1,2,2-Tetrachloroethane	79-34-5	167.9	ND	0.50		ND	3.4	
4-Ethyltoluene	622-96-8	120.2	ND	0.50		ND	2.5	
1,3,5-Trimethylbenzene	108-67-8	120.2	ND	0.50		ND	2.5	
2-Chlorotoluene	95-49-8	126.6	ND	0.50		ND	2.6	
1,2,4-Trimethylbenzene	95-63-6	120.2	ND	0.50		ND	2.5	
1,3-Dichlorobenzene	541-73-1	147.0	ND	0.50		ND	3.0	
1,4-Dichlorobenzene	106-46-7	147.0	ND	0.50		ND	3.0	
Benzyl chloride	100-44-7	126.0	ND	0.50		ND	2.6	
1,2-Dichlorobenzene	95-50-1	147.0	ND	0.50		ND	3.0	
1,2,4-Trichlorobenzene	120-82-1	181.5	ND	0.50		ND	3.7	
Hexachloro-1,3-butadiene	87-68-3	260.8	ND	0.50		ND	5.3	
Naphthalene	91-20-3	128.17	ND	0.50		ND	2.6	
Total Target Compound Concen	trations:		24	ppbv		67	ug/m3	

Total Target Compound Concentrations:

Result Spike Recovery 10 10

Qualifier Definitions

4-Bromofluorobenzene

ND = Non Detect

Surrogate

B = Compound also found in method blank.

E= Estimated concentration exceeding upper calibration range

D= Result reported from diluted analysis.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

Page 9 of 21 V129a Page 2 of 4 691902551-2_R0.xlsm



EMSL Canada Inc.

 EMSL Order #: 691902551

EMSL Sample #: 691902551-2

Customer ID: 55VAND29

Customer PO: Not Available

Robin Van Driel
VanDriel OHS Consulting
PO Box 19098 Fourth Ave PO
Vancouver, BC V6K 4R8

Project: IAQ2

Sample ID: 2

<u>Analysis</u>	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	10/04/2019	TP	P7177.D	HD2787	250 cc	1

Tentatively Identified Compound Results Summary

			Result		Result	Retention	
Tentatively Identified Compounds	CAS#	MW(1)	ppbv	Q	ug/m3	Time	Comments
Pentane	000109-66-0	72	2.5	JN	7.2	8.6	
1,1-Dichloro-1-fluoroethane	001717-00-6	116	1.9	JN	8.9	9.65	
Nonane	000111-84-2	128	1.0	JN	5.4	25.11	
Nonane, 4-methyl-	017301-94-9	142	3.6	JN	21	26.57	
unknown		92	1.0	JN	3.9	26.81	
Decane	000124-18-5	142	1.8	JN	11	27.42	
Decane, 4-methyl-	002847-72-5	156	1.0	JN	6.6	27.85	
Benzaldehyde	000100-52-7	106	1.1	JN	4.6	28.89	
	_						
	_						
	_						
·	Total TIC Conce	entrations:	14	ppbv	69	ug/m3	1

Qualifier Definitions

- (1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.
- B = Compound also found in method blank.
- J= Estimated value based on a 1:1 response to internal standard.
- N= Presumptive evidence of compound based on library match.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

691902551-2_R0.xlsm V129a Page 10 of 21 Page 3 of 4



EMSL Canada Inc.

4506 Dawson Street, Burnaby, BC V5C 4C1 Phone/Fax: (604)757-3158 / (604)757-4731 http://www.EMSL.com_vancouverlab@EMSL.com

EMSL Order #: 691902551 EMSL Sample #: 691902551-2 Customer ID: 55VAND29 Customer PO: Not Available

Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

Phone: 778-879-8009 Fax: Not Available Date Collected: 10/2/2019 Date Received: 10/3/2019

Project: IAQ2

Sample ID: 2

Analysis Initial	Analysis Date 10/04/2019	Analyst Init. TP	Lab File ID P7177.D	Canister ID HD2787	Sample Vol. 250 cc	<u>Dil. Factor</u> 1

Total Volatile Organic Compounds (TVOC) Summary

			Result	RL		Result	RL	
Target Compounds	CAS#	MW	ppbv	ppbv	Q	ug/m3	ug/m3	Comments
Freon 12(Dichlorodifluoromethane)	75-71-8	120.90	5.0	0.50		25	2.5	
Chloromethane	74-87-3	50.49	0.51	0.50		1.0	1.0	
n-Butane	106-97-8	58.12	0.87	0.50		2.1	1.2	
Ethanol	64-17-5	46.07	7.7	0.50		14	0.94	
Isopropyl alcohol(2-Propanol)	67-63-0	60.10	5.9	0.50		15	1.2	
Acetone	67-64-1	58.08	4.3	0.50		10	1.2	
Total Target Compound Concentrations:			24	ppbv		67	ug/m3	

Qualifier Definitions

- B = Compound also found in method blank.
- E= Estimated concentration exceeding upper calibration range.
- D= Result reported from diluted analysis.

Tentatively Identified Compounds	CAS#	MW(1)	Result ppbv		Q	Result ug/m3	Retention Time	Comments
Pentane	000109-66-0	72	2.5		JN	7.2	8.6	
1,1-Dichloro-1-fluoroethane	001717-00-6	116	1.9		JN	8.9	9.65	
Nonane	000111-84-2	128	1.0		JN	5.4	25.11	
Nonane, 4-methyl-	017301-94-9	142	3.6		JN	21	26.57	
unknown		92	1.0		JN	3.9	26.81	
Decane	000124-18-5	142	1.8		JN	11	27.42	
Decane, 4-methyl-	002847-72-5	156	1.0		JN	6.6	27.85	
Benzaldehyde	000100-52-7	106	1.1		JN	4.6	28.89	
	Total TIC Conce	entrations:	14	ppby		69	ug/m3	

- Qualifier Definitions
 (1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.
- B = Compound also found in method blank.
- J= Estimated value based on a 1:1 response to internal standard.
- N= Presumptive evidence of compound based on library match.

Total Volatile Organic Compounds (TVOCs):	38	nnhy	1 1	140	ug/m3	



 EMSL Order #: 691902551

EMSL Sample #: 691902551-3

Customer ID: 55VAND29

Customer PO: Not Available

Attn: Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

Project: IAQ2 Sample ID: 3

Analysis	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	10/05/2019	KW	J6198.D	HD2789	250 cc	1

Target Compound Results Summary

	ı arg	et Compo	ound Resul	Name and Address of the Control of t	nary			
Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
Propylene	115-07-1	42.08	ND	1.0		ND	1.7	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.9	2.1	0.50		11	2.5	
Freon 114(1,2-Dichlorotetrafluoroethan	76-14-2	170.9	ND	0.50		ND	3.5	
Chloromethane	74-87-3	50.49	ND	0.50		ND	1.0	
n-Butane	106-97-8	58.12	4.0	0.50		9.5	1.2	
Vinyl chloride	75-01-4	62.50	ND	0.50		ND	1.3	
1.3-Butadiene	106-99-0	54.09	ND	0.50	\vdash	ND	1.1	
Bromomethane	74-83-9	94.94	ND	0.50	\Box	ND	1.9	
Chloroethane	75-00-3	64.52	ND	0.50	\Box	ND	1.3	
Ethanol	64-17-5	46.07	11	0.50		21	0.94	
Bromoethene(Vinyl bromide)	593-60-2	106.9	ND	0.50		ND	2.2	
Freon 11(Trichlorofluoromethane)	75-69-4	137.4	ND	0.50		ND	2.8	
Isopropyl alcohol(2-Propanol)	67-63-0	60.10	8.8	0.50		22	1.2	
Freon 113(1,1,2-Trichlorotrifluoroethan	76-13-1	187.4	ND	0.50		ND	3.8	
Acetone	67-64-1	58.08	8.5	0.50		20	1.2	
1.1-Dichloroethene	75-35-4	96.94	ND	0.50		ND	2.0	
Acetonitrile	75-05-8	41.00	ND	0.50	\Box	ND	0.84	
Tertiary butyl alcohol(TBA)	75-65-0	74.12	ND	0.50	\Box	ND	1.5	
Bromoethane(Ethyl bromide)	74-96-4	108.0	ND	0.50	\Box	ND	2.2	
3-Chloropropene(Allyl chloride)	107-05-1	76.53	ND	0.50	\vdash	ND	1.6	
Carbon disulfide	75-15-0	76.14	ND	0.50	\vdash	ND	1.6	
Methylene chloride	75-09-2	84.94	ND	0.50	\vdash	ND	1.7	
Acrylonitrile	107-13-1	53.00	ND	0.50	\vdash	ND	1.1	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.15	ND	0.50	\vdash	ND	1.8	
trans-1,2-Dichloroethene	156-60-5	96.94	ND	0.50	\vdash	ND	2.0	
n-Hexane	110-54-3	86.17	ND	0.50	\vdash	ND	1.8	
1,1-Dichloroethane	75-34-3	98.96	ND	0.50	\vdash	ND	2.0	
Vinvl acetate	108-05-4	86.00	ND	0.50	\vdash	ND	1.8	
2-Butanone(MEK)	78-93-3	72.10	ND	0.50	\vdash	ND	1.5	
cis-1,2-Dichloroethene	156-59-2	96.94	ND	0.50	\vdash	ND	2.0	
Ethyl acetate	141-78-6	88.10	ND	0.50	\Box	ND	1.8	
Chloroform	67-66-3	119.4	ND	0.50	\vdash	ND	2.4	
Tetrahydrofuran	109-99-9	72.11	ND	0.50	\vdash	ND	1.5	
1.1.1-Trichloroethane	71-55-6	133.4	ND	0.50	\vdash	ND	2.7	
Cyclohexane	110-82-7	84.16	ND	0.50	\Box	ND	1.7	
2,2,4-Trimethylpentane(Isooctane)	540-84-1	114.2	ND	0.50	\vdash	ND	2.3	
Carbon tetrachloride	56-23-5	153.8	ND	0.50	\vdash	ND	3.1	
n-Heptane	142-82-5	100.2	ND	0.50	\Box	ND	2.0	
1,2-Dichloroethane	107-06-2	98.96	ND	0.50	\vdash	ND	2.0	
Benzene	71-43-2	78.11	ND	0.50	\vdash	ND	1.6	
Trichloroethene	79-01-6	131.4	ND	0.50	\vdash	ND	2.7	
1,2-Dichloropropane	78-87-5	113.0	ND	0.50	\vdash	ND	2.3	
Methyl Methacrylate	80-62-6	100.12	ND	0.50	\vdash	ND	2.0	
Bromodichloromethane	75-27-4	163.8	ND	0.50	\vdash	ND	3.3	
1,4-Dioxane	123-91-1	88.12	ND	0.50	\vdash	ND	1.8	
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	ND	0.50	\vdash	ND	2.0	

691902551-3_R0 V129a Page 12 of 21 Page 10 f 4



 EMSL Order #: 691902551

EMSL Sample #: 691902551-3

Customer ID: 55VAND29

Customer PO: Not Available

Attn: Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

Project: IAQ2 Sample ID: 3

<u>Analysis</u>	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	10/05/2019	KW	J6198.D	HD2789	250 cc	1

Target Compound Results Summary

Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
cis-1,3-Dichloropropene	10061-01-5	111.0	ND	0.50		ND	2.3	
Toluene	108-88-3	92.14	0.72	0.50		2.7	1.9	
trans-1,3-Dichloropropene	10061-02-6	111.0	ND	0.50		ND	2.3	
1.1.2-Trichloroethane	79-00-5	133.4	ND	0.50		ND	2.7	
2-Hexanone(MBK)	591-78-6	100.1	ND	0.50		ND	2.0	
Tetrachloroethene	127-18-4	165.8	ND	0.50		ND	3.4	
Dibromochloromethane	124-48-1	208.3	ND	0.50		ND	4.3	
1,2-Dibromoethane	106-93-4	187.8	ND	0.50		ND	3.8	
Chlorobenzene	108-90-7	112.6	ND	0.50		ND	2.3	
Ethylbenzene	100-41-4	106.2	ND	0.50		ND	2.2	
Xylene (p,m)	1330-20-7	106.2	ND	1.0		ND	4.3	
Xylene (Ortho)	95-47-6	106.2	ND	0.50		ND	2.2	
Styrene	100-42-5	104.1	ND	0.50		ND	2.1	
Isopropylbenzene (cumene)	98-82-8	120.19	ND	0.50		ND	2.5	
Bromoform	75-25-2	252.8	ND	0.50		ND	5.2	
1,1,2,2-Tetrachloroethane	79-34-5	167.9	ND	0.50		ND	3.4	
4-Ethyltoluene	622-96-8	120.2	ND	0.50		ND	2.5	
1,3,5-Trimethylbenzene	108-67-8	120.2	ND	0.50		ND	2.5	
2-Chlorotoluene	95-49-8	126.6	ND	0.50		ND	2.6	
1,2,4-Trimethylbenzene	95-63-6	120.2	ND	0.50		ND	2.5	
1,3-Dichlorobenzene	541-73-1	147.0	ND	0.50		ND	3.0	
1,4-Dichlorobenzene	106-46-7	147.0	ND	0.50		ND	3.0	
Benzyl chloride	100-44-7	126.0	ND	0.50		ND	2.6	
1,2-Dichlorobenzene	95-50-1	147.0	ND	0.50		ND	3.0	
1,2,4-Trichlorobenzene	120-82-1	181.5	ND	0.50		ND	3.7	
Hexachloro-1,3-butadiene	87-68-3	260.8	ND	0.50		ND	5.3	
Naphthalene	91-20-3	128.17	ND	0.50		ND	2.6	
Total Target Compound Concentrations:		35	ppbv		86	ug/m3		

 Surrogate
 Result
 Spike
 Recovery

 4-Bromofluorobenzene
 9.9
 10
 99%

Qualifier Definitions

ND = Non Detect

- B = Compound also found in method blank.
- ${\sf E=Estimated\ concentration\ exceeding\ upper\ calibration\ range}.$
- D= Result reported from diluted analysis.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

691902551-3_R0 V129a Page 13 of 21 Page 2 of 4



 EMSL Order #: 691902551

EMSL Sample #: 691902551-3

Customer ID: 55VAND29

Customer PO: Not Available

Attn: Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

Project: IAQ2 Sample ID: 3

 Analysis
 Analysis Date
 Analyst Init.
 Lab File ID
 Canister ID
 Sample Vol.
 Dil. Factor

 Initial
 10/05/2019
 KW
 J6198.D
 HD2789
 250 cc
 1

Tentatively Identified Compound Results Summary

			Result		Result	Retention	
Tentatively Identified Compounds	CAS#	MW(1)	ppbv	Q	ug/m3	Time	Comments
Propane	000074-98-6	44	3.2	JN	5.7	4.871	
Pentane	000109-66-0	72	6.7	JN	20	8.00	
1,1-Dichloro-1-fluoroethane	001717-00-6	116	1.0	JN	4.9	8.93	
Nonane	000111-84-2	128	1.5	JN	8.0	24.39	
unknown hydrocarbon		92	1.2	JN	4.4	25.19	
unknown		92	1.3	JN	4.9	25.36	
unknown hydrocarbon		92	3.8	JN	14	25.87	
unknown hydrocarbon		92	1.1	JN	4.0	26.09	
Decane	000124-18-5	142	4.6	JN	27	26.70	
unknown		92	1.5	JN	5.5	26.94	
unknown hydrocarbon		92	1.9	JN	7.0	27.13	
Cyclohexane, butyl-	001678-93-9	140	1.1	JN	6.5	28.15	
Undecane	001120-21-4	156	1.2	JN	7.9	28.76	
						 	
						 	
	Total TIC Conce	entrations:	30	ppbv	120	ug/m3	

Qualifier Definitions

- (1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.
- B = Compound also found in method blank.
- J= Estimated value based on a 1:1 response to internal standard.
- N= Presumptive evidence of compound based on library match.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

691902551-3_R0 V129a Page 14 of 21 Page 3 of 4



EMSL Canada Inc.

4506 Dawson Street, Burnaby, BC V5C 4C1 Phone/Fax: (604)757-3158 / (604)757-4731 http://www.EMSL.com_vancouverlab@EMSL.com

EMSL Order #: 691902551 EMSL Sample #: 691902551-3 Customer ID: 55VAND29 Customer PO: Not Available

Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

778-879-8009 Phone: Fax: Not Available Date Collected: 10/2/2019 Date Received: 10/3/2019

Project: IAQ2

Sample ID: 3

Analysis	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	10/05/2019	KW	J6198.D	HD2789	250 cc	1

Total Volatile Organic Compounds (TVOC) Summary

			Result	RL		Result	RL	
Target Compounds	CAS#	MW	ppbv	ppbv	Q	ug/m3	ug/m3	Comments
Freon 12(Dichlorodifluoromethane)	75-71-8	120.90	2.1	0.50		11	2.5	
n-Butane	106-97-8	58.12	4.0	0.50		9.5	1.2	
Ethanol	64-17-5	46.07	11	0.50		21	0.94	
Isopropyl alcohol(2-Propanol)	67-63-0	60.10	8.8	0.50		22	1.2	
Acetone	67-64-1	58.08	8.5	0.50		20	1.2	
Toluene	108-88-3	92.14	0.72	0.50		2.7	1.9	
Total Target Co	mpound Conce	ntrations:	35	ppbv	1	86	ug/m3	

Qualifier Definitions

- B = Compound also found in method blank.
- E= Estimated concentration exceeding upper calibration range
- D= Result reported from diluted analysis.

			Result			Result	Retention	
Tentatively Identified Compounds	CAS#	MW(1)	ppbv		Q	ug/m3	Time	Comments
Propane	000074-98-6	44	3.2		JN	5.7	4.871	
Pentane	000109-66-0	72	6.7		JN	20	8.002	
1,1-Dichloro-1-fluoroethane	001717-00-6	116	1.0		JN	4.9	8.927	
Nonane	000111-84-2	128	1.5		JN	8.0	24.391	
unknown hydrocarbon		92	1.2		JN	4.4	25.185	
unknown		92	1.3		JN	4.9	25.363	
unknown hydrocarbon		92	3.8		JN	14	25.873	
unknown hydrocarbon		92	1.1		JN	4.0	26.086	
Decane	000124-18-5	142	4.6		JN	27	26.703	
unknown		92	1.5		JN	5.5	26.94	
unknown hydrocarbon		92	1.9		JN	7.0	27.13	
Cyclohexane, butyl-	001678-93-9	140	1.1		JN	6.5	28.15	
Undecane	001120-21-4	156	1.2		JN	7.9	28.755	
	Total TIC Conce	entrations:	30	ppbv		120	ug/m3	

- Qualifier Definitions
 (1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.
- B = Compound also found in method blank.
 J= Estimated value based on a 1:1 response to internal standard.
- N= Presumptive evidence of compound based on library match.

	Total Volatile Organic Compounds (TVOCs):	65	ppby	1	210	ug/m3	1
--	---	----	------	----------	-----	-------	---



 EMSL Order #: 691902551
EMSL Sample #: 691902551-4
Customer ID: 55VAND29
Customer PO: Not Available

Attn: Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

Project: IAQ2 Sample ID: 4

 Analysis
 Analysis Date
 Analyst Init.
 Lab File ID
 Canister ID
 Sample Vol.
 Dil. Factor

 Initial
 10/05/2019
 KW
 J6208.D
 HD2173
 451 cc
 1.09

Target Compound Results Summary

	ı arg	et Compo	ound Resul		nary			
Target Compounds	CAS#	MW	Result ppbv	RL ppbv	Q	Result ug/m3	RL ug/m3	Comments
Propylene	115-07-1	42.08	ND	1.1		ND	1.9	
Freon 12(Dichlorodifluoromethane)	75-71-8	120.9	0.55	0.55		2.7	2.7	
Freon 114(1,2-Dichlorotetrafluoroethan	76-14-2	170.9	ND	0.55		ND	3.8	
Chloromethane	74-87-3	50.49	0.65	0.55		1.3	1.1	
n-Butane	106-97-8	58.12	1.1	0.55		2.7	1.3	
Vinyl chloride	75-01-4	62.50	ND	0.55		ND	1.4	
1.3-Butadiene	106-99-0	54.09	ND	0.55	\vdash	ND	1,2	
Bromomethane	74-83-9	94.94	ND	0.55	\Box	ND	2.1	
Chloroethane	75-00-3	64.52	ND	0.55		ND	1.4	
Ethanol	64-17-5	46.07	19	0.55		37	1.0	
Bromoethene(Vinyl bromide)	593-60-2	106.9	ND	0.55		ND	2.4	
Freon 11(Trichlorofluoromethane)	75-69-4	137.4	ND	0.55	\vdash	ND	3.1	
Isopropyl alcohol(2-Propanol)	67-63-0	60.10	5.8	0.55		14	1.3	
Freon 113(1,1,2-Trichlorotrifluoroethan	76-13-1	187.4	ND	0.55		ND	4.2	
Acetone	67-64-1	58.08	4.9	0.55		12	1.3	
1.1-Dichloroethene	75-35-4	96.94	ND	0.55		ND	2.2	
Acetonitrile	75-05-8	41.00	ND	0.55	\vdash	ND	0.91	
Tertiary butyl alcohol(TBA)	75-65-0	74.12	ND	0.55	\vdash	ND	1.7	
Bromoethane(Ethyl bromide)	74-96-4	108.0	ND	0.55	\vdash	ND	2.4	
3-Chloropropene(Allyl chloride)	107-05-1	76.53	ND	0.55	\vdash	ND	1.7	
Carbon disulfide	75-15-0	76.14	ND	0.55	\vdash	ND	1.7	
Methylene chloride	75-09-2	84.94	ND	0.55	\vdash	ND	1.9	
Acrylonitrile	107-13-1	53.00	ND	0.55	\vdash	ND	1.2	
Methyl-tert-butyl ether(MTBE)	1634-04-4	88.15	ND	0.55	\vdash	ND	2.0	
trans-1,2-Dichloroethene	156-60-5	96.94	ND	0.55	\vdash	ND	2.2	
n-Hexane	110-54-3	86.17	ND	0.55	\vdash	ND	1.9	
1,1-Dichloroethane	75-34-3	98.96	ND	0.55	\vdash	ND	2.2	
Vinyl acetate	108-05-4	86.00	ND	0.55	\vdash	ND	1.9	
2-Butanone(MEK)	78-93-3	72.10	ND	0.55	\vdash	ND	1.6	
cis-1,2-Dichloroethene	156-59-2	96.94	ND	0.55	\vdash	ND	2.2	
AND AND ADDRESS OF THE AND ADDRESS OF THE ADDRESS O	141-78-6	88.10	0.57	0.55		2.1	2.0	
Ethyl acetate Chloroform	67-66-3	119.4	ND	0.55		ND	2.7	
		72.11	ND	0.55	\vdash	ND	1.6	
Tetrahydrofuran 1,1,1-Trichloroethane	109-99-9 71-55-6	133.4	ND	0.55	\vdash	ND	3.0	
	110-82-7	84.16	ND	0.55	\vdash	ND	1.9	
Cyclohexane	540-84-1	114.2	ND	0.55	\vdash	ND	2.5	
2,2,4-Trimethylpentane(Isooctane) Carbon tetrachloride	56-23-5	153.8	ND	0.55	\vdash	ND	3.4	
	_				\vdash		_	
n-Heptane	142-82-5	100.2	ND	0.55	\vdash	ND	2.2	
1,2-Dichloroethane	107-06-2	98.96	ND	0.55	\vdash	ND		
Benzene	71-43-2	78.11	ND	0.55	\vdash	ND	1.7	
Trichloroethene	79-01-6	131.4	ND	0.55	\vdash	ND	2.9	
1,2-Dichloropropane	78-87-5	113.0	ND	0.55	\vdash	ND	2.5	
Methyl Methacrylate	80-62-6	100.12	ND	0.55	\vdash	ND	2.2	
Bromodichloromethane	75-27-4	163.8	ND	0.55	\vdash	ND	3.7	
1,4-Dioxane	123-91-1	88.12	ND	0.55	\vdash	ND	2.0	
4-Methyl-2-pentanone(MIBK)	108-10-1	100.2	ND	0.55		ND	2.2	

691902551-4_R0 V129a Page 16 of 21 Page 1 of 4



 EMSL Order #: 691902551

EMSL Sample #: 691902551-4

Customer ID: 55VAND29

Customer PO: Not Available

Attn: Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

Project: IAQ2 Sample ID: 4

Analysis	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	10/05/2019	KW	J6208.D	HD2173	451 cc	1.09

Target Compound Results Summary

			Result	RL		Result	RL	
Target Compounds	CAS#	MW	ppbv	ppbv	Q	ug/m3	ug/m3	Comments
cis-1,3-Dichloropropene	10061-01-5	111.0	ND	0.55		ND	2.5	
Toluene	108-88-3	92.14	ND	0.55		ND	2.1	
trans-1,3-Dichloropropene	10061-02-6	111.0	ND	0.55		ND	2.5	
1,1,2-Trichloroethane	79-00-5	133.4	ND	0.55		ND	3.0	
2-Hexanone(MBK)	591-78-6	100.1	ND	0.55		ND	2.2	
Tetrachloroethene	127-18-4	165.8	ND	0.55		ND	3.7	
Dibromochloromethane	124-48-1	208.3	ND	0.55		ND	4.6	
1,2-Dibromoethane	106-93-4	187.8	ND	0.55		ND	4.2	
Chlorobenzene	108-90-7	112.6	ND	0.55		ND	2.5	
Ethylbenzene	100-41-4	106.2	ND	0.55		ND	2.4	
Xylene (p,m)	1330-20-7	106.2	ND	1.1		ND	4.7	
Xylene (Ortho)	95-47-6	106.2	ND	0.55		ND	2.4	
Styrene	100-42-5	104.1	ND	0.55		ND	2.3	
Isopropylbenzene (cumene)	98-82-8	120.19	ND	0.55		ND	2.7	
Bromoform	75-25-2	252.8	ND	0.55		ND	5.6	
1,1,2,2-Tetrachloroethane	79-34-5	167.9	ND	0.55		ND	3.7	
4-Ethyltoluene	622-96-8	120.2	ND	0.55		ND	2.7	
1,3,5-Trimethylbenzene	108-67-8	120.2	ND	0.55		ND	2.7	
2-Chlorotoluene	95-49-8	126.6	ND	0.55		ND	2.8	
1,2,4-Trimethylbenzene	95-63-6	120.2	ND	0.55		ND	2.7	
1,3-Dichlorobenzene	541-73-1	147.0	ND	0.55		ND	3.3	
1,4-Dichlorobenzene	106-46-7	147.0	ND	0.55		ND	3.3	
Benzyl chloride	100-44-7	126.0	ND	0.55		ND	2.8	
1,2-Dichlorobenzene	95-50-1	147.0	ND	0.55		ND	3.3	
1,2,4-Trichlorobenzene	120-82-1	181.5	ND	0.55		ND	4.0	
Hexachloro-1,3-butadiene	87-68-3	260.8	ND	0.55		ND	5.8	
Naphthalene	91-20-3	128.17	ND	0.55		ND	2.9	
Total Target Compound Concentrations:			33	ppbv		72	ug/m3	

 Surrogate
 Result
 Spike
 Recovery

 4-Bromofluorobenzene
 9.9
 10
 99%

Qualifier Definitions

ND = Non Detect

B = Compound also found in method blank.

E= Estimated concentration exceeding upper calibration range.

D= Result reported from diluted analysis.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

6919025514_R0 V129a Page 17 of 21 Page 2 of 4



 EMSL Order #: 691902551

EMSL Sample #: 691902551-4

Customer ID: 55VAND29

Customer PO: Not Available

Attn: Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

Project: IAQ2

Sample ID: 4

Analysis	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	10/05/2019	KW	J6208.D	HD2173	451 cc	1.09

Tentatively Identified Compound Results Summary

			Result		Result	Retention	
Tentatively Identified Compounds	CAS#	MW(1)	ppbv	Q	ug/m3	Time	Comments
Ethane, 1,1-difluoro-	000075-37-6	66	1.5	JN	4.0	4.895	
Cyclohexane, propyl-	001678-92-8	126	1.9	JN	9.9	25.87	
Decane	000124-18-5	142	2.3	JN	13	26.70	
	_						
	_						
	_						
	Total TIC Conce	entrations:	5.7	ppbv	27	ug/m3	

Qualifier Definitions

- (1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.
- B = Compound also found in method blank.
- J= Estimated value based on a 1:1 response to internal standard.
- N= Presumptive evidence of compound based on library match.

Method Reference

USEPA: Compendium Method TO-15, "Determination of Volatile Organic Compounds (VOCs) in Air..." Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS), January 1999, (EPA/625/R-96/010b).

691902551-4_R0 V129a Page 18 of 21 Page 3 of 4



EMSL Canada Inc.

4506 Dawson Street, Burnaby, BC V5C 4C1 Phone/Fax: (604)757-3158 / (604)757-4731 http://www.EMSL.com vancouverlab@EMSL.com

EMSL Order #: 691902551 EMSL Sample #: 691902551-4 Customer ID: 55VAND29 Customer PO: Not Available

Robin Van Driel VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

Phone: 778-879-8009 Not Available Fax: Date Collected: 10/2/2019 Date Received: 10/3/2019

Project: IAQ2

Sample ID: 4

Analysis	Analysis Date	Analyst Init.	Lab File ID	Canister ID	Sample Vol.	Dil. Factor
Initial	10/05/2019	KW	J6208.D	HD2173	451 cc	1.09

Total Volatile Organic Compounds (TVOC) Summary

			Result	RL		Result	RL	
Target Compounds	CAS#	MW	ppbv	ppbv	Q	ug/m3	ug/m3	Comments
Freon 12(Dichlorodifluoromethane)	75-71-8	120.90	0.55	0.55		2.7	2.7	
Chloromethane	74-87-3	50.49	0.65	0.55		1.3	1.1	
n-Butane	106-97-8	58.12	1.1	0.55		2.7	1.3	
Ethanol	64-17-5	46.07	19	0.55		37	1.0	
Isopropyl alcohol(2-Propanol)	67-63-0	60.10	5.8	0.55		14	1.3	
Acetone	67-64-1	58.08	4.9	0.55		12	1.3	
Ethyl acetate	141-78-6	88.10	0.57	0.55		2.1	2.0	
Total Target Co	33	ydag		72	ug/m3			

Qualifier Definitions

- B = Compound also found in method blank.
- E= Estimated concentration exceeding upper calibration range.
- D= Result reported from diluted analysis.

Tentatively Identified Compounds	CAS#	MW(1)	Result ppbv		Q	Result ug/m3	Retention Time	Comments
Ethane, 1,1-difluoro-	000075-37-6	66	1.5		JN	4.0	4.895	
Cyclohexane, propyl-	001678-92-8	126	1.9		JN	9.9	25.873	
Decane	000124-18-5	142	2.3		JN	13	26.703	
	Total TIC Conce	ntrations:	5.7	pphy		27	ua/m3	

Qualifier Definitions

- (1) = If unknown, MW is assigned as equivalent Toluene (92) for ug/m3 conversion purposes.
- B = Compound also found in method blank.
- J= Estimated value based on a 1:1 response to internal standard.
- N= Presumptive evidence of compound based on library match.

Total Volatile Organic Compounds (TVOCs): 39 100 ppbv



4506 Dawson Street Burnaby, BC V5C 4C1 Phone/Fax: (604) 757-3158 / (604) 757-4731 http://www.EMSL.com / vancouverlab@EMSL.com Order ID: 691902552 Customer ID: 55VAND29

Customer PO: Project ID:

Attn: Robin Van Driel

VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8 Phone: (778) 879-8009 Fax:

Collected: 10/02/2019 Received: 10/03/2019 Analyzed: 10/03/2019

Proj: IAQ 2

Test Report: Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Tape Samples (EMSL Method MICRO-SOP-200)

Lab Sample Number	Client Sample ID	Location	Fungal Identification	Category
691902552-0011	B04	CEILING - CENTRAL	Ascospores	Rare
			Basidiospores	Rare
			Cladosporium	Rare
			Myxomycetes++	Rare
691902552-0012	B05	CONCRETE - CRAWLSPACE BY EXPOSED PLYWOOD	Ascospores	Rare
			Aspergillus/Penicillium	Rare
			Basidiospores	Low
			Chaetomium	Rare
			Cladosporium	Rare
			Hyphal Fragment	Medium
			Myxomycetes++	Rare
691902552-0013	B06	WOOD - CRAWLSPACE BY SUMP TANK PIPE	Ascospores	Rare
			Basidiospores	Low
			Hyphal Fragment	Medium
			Stachybotrys/Memnoniella	Rare

No discernable field blank was submitted with this group of samples.

Bipolaris++ = Bipolaris/Dreschlera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut
* = Sample contains fruiting structures and/or hyphae associated with the spores.

- Denotes Not Detected

 Category
 Count/area Analyzed

 Rare
 1 to 10

 Low
 11 to 100

 Medium
 101 to 1000

 High
 > 1000

Nicole Yeo, Laboratory Manager or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report.

Samples analyzed by EMSL Canada Inc. Burnaby, BC CALA Accreditation #A3998

Initial report from: 10/04/2019 11:14:43

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com

Test Report DEVER2-7.50.2 Printed: 10/04/2019 11:14:43AM

Page 1 of 1



4506 Dawson Street Burnaby, BC V5C 4C1 Tel/Fax: (604) 757-3158 / (604) 757-4731 http://www.EMSL.com / vancouverlab@EMSL.com EMSL Canada Order: 691902552 Customer ID: 55VAND29

> **Customer PO:** Project ID:

Phone: (778) 879-8009 Attn: Robin Van Driel

VanDriel OHS Consulting Fax: PO Box 19098 Fourth Ave PO Collected: 10/02/2019 Vancouver, BC V6K 4R8 Received: 10/03/2019 Analyzed: 10/03/2019

Project: IAQ 2

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L): Sample Location		691902552-0001 N01 150 ORRIDOR - EAS			691902552-000 N02 150 SPACE - STOC		691902552-0003 N03 150 SUPPLY CLOSET - WEST			
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m ³	% of Total	Raw Count Count/m³ % of Total			
Alternaria (Ulocladium)	-	-	-	-	-		-	-	-	
Ascospores	4	90	5.6	1	20	1.2	-	-	-	
Aspergillus/Penicillium	4	90	5.6	7	100	5.9	12	260	27.7	
Basidiospores	67	1400	87.5	72	1500	88.2	32	680	72.3	
Bipolaris++	-	-	-	-	-	-	-	-	-	
Chaetomium	-	-	-	-		-	-	-		
Cladosporium	1	20	1.3	3	60	3.5	-	-	-	
Curvularia	-	-	-	-	-	-	-	-	-	
Epicoccum	-	-	-	-	-	-	-	-	-	
Fusarium	-	-	-	-	-	-	-	-	-	
Ganoderma	-	-	-	1	20	1.2	-	-	-	
Myxomycetes++	-	-	-	-	-	-	-	-	-	
Pithomyces++	-	-	-	-	-	-	-	-	-	
Rust	-	-	-	-	-	-	-	-	-	
Scopulariopsis/Microascus	-	-	·=	-	-	-	-	-	-	
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-	
Unidentifiable Spores	-	-	-	-	-	-	-	-	-	
Zygomycetes	-	-	-	-	-	-	-	-	-	
Polythrincium	-	-	-	-	-	-	-	-	-	
Total Fungi	76	1600	100	84	1700	100	44	940	100	
Hyphal Fragment	-	-	-	-	-	-	-	-	-	
Insect Fragment	-	-	-	-	-	-	-	-	:=:	
Pollen	-	-	-	-	-	-	-	-	-	
Analyt. Sensitivity 600x	-	21	-	-	21	-	-	21	-	
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-	
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-	
Fibrous Particulate (1-4)	-	2	-	-	3	-	-	2	-	
Background (1-5)	-	3	-	-	3	-	-	3	-	

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

No discernable field blank was submitted with this group of samples.

Nicole Yeo, Laboratory Manager

or other approved signato

Samples received in good condition unless otherwise noted. High levels of background particulate can obscure spores and other particulates, leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, polen, fiber particide or insect fragment. **Dendered based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the clent. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report.

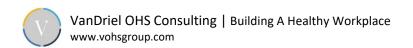
Initial report from: 10/04/2019 11:14:43

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

MIC_M001_0002_0001 1.71 Printed: 10/04/2019 11:14 AM

Samples analyzed by EMSL Canada Inc. Burnaby, BC CALA Accreditation #A3998

Page 1 of 4





EMSL Canada Inc.

4506 Dawson Street Burnaby, BC V5C 4C1
Tel/Fax: (604) 757-3158 / (604) 757-4731
http://www.EMSL.com / vancouverlab@EMSL.com

EMSL Canada Order: 691902552 Customer ID: 55VAND29

Customer PO: Project ID:

Attn: Robin Van Driel

VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8 Phone: (778) 879-8009

Fax:

Collected: 10/02/2019 **Received:** 10/03/2019 **Analyzed:** 10/03/2019

Project: IAQ 2

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L):		691902552-0004 N04 150	1		691902552-0009 N05 150		691902552-0006 N06 150			
Sample Location		ROOM 20			DE - EAST ENT		SUPPLY CLOSET - EAST			
Spore Types	Raw Count	Count/m ³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m ³	% of Total	
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-	
Ascospores	-	-	-	29	620	4.6	25	530	3.5	
Aspergillus/Penicillium	-	-	-	1	20	0.1	-	-	-	
Basidiospores	12	260	100	590	12600	93.8	685	14600	95.4	
Bipolaris++	-	-	-	-	-	-	-	-	-	
Chaetomium		-	-	-	-	-	-	-	-	
Cladosporium	-	-	-	4	90	0.7	7	100	0.7	
Curvularia	-	-	-	-	-	-	-	-	-	
Epicoccum	-	-	-	-	-	-	-	-	-	
Fusarium	-	-	-	-	H.	-	-	-	-	
Ganoderma	-	-	-	2	40	0.3	1	20	0.1	
Myxomycetes++	-		-	3	60	0.4	2	40	0.3	
Pithomyces++	-	-	-	-	-	-	-		-	
Rust	-	-	-	-	-	-	-	-	-	
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-	
Stachybotrys/Memnoniella	-	.=	-	-	-	-	-	-	-	
Unidentifiable Spores	-	-	-	-	-	-	-	-	-	
Zygomycetes	-	-	-	-	-	-		-	-	
Polythrincium	-	-	-	-	-	-	1	20	0.1	
Total Fungi	12	260	100	629	13430	100	721	15310	100	
Hyphal Fragment		-	-	-	-	-	-	-	-	
Insect Fragment	-	-	-	-	-	-	-	-	-	
Pollen		-	-	-	-	-		-	-	
Analyt. Sensitivity 600x	-	21	1-	-	21	-		21	-	
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-	
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-	
Fibrous Particulate (1-4)	-	2	-	-	2	-	-	2	-	
Background (1-5)	-	2	-	-	3	-	-	3	-	

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

Nicole Yeo, Laboratory Manager or other approved signatory

No discernable field blank was submitted with this group of samples. \\

Samples received in good condition unless otherwise noted. High levels of background particulate can obscure spores and other particulates, leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, polen, liber particle or insect fragment. ""Denotes particles found at 300X." Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains isability limited to cost of analysis. This report relates only to the samples reported above any not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations, Interpretation and use of test results are the responsibility of the client. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report.

Samples analyzed by EMSL Canada Inc. Burnaby, BC CALA Accreditation #A3998

Initial report from: 10/04/2019 11:14:43

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

MIC_M001_0002_0001 1.71 Printed: 10/04/2019 11:14 AM

Page 2 of 4

Preliminary Indoor Air Quality Investigation Report for Parkview Elementary School – Part 2 | School District 83



EMSL Canada Inc.

4506 Dawson Street Burnaby, BC V5C 4C1
Tel/Fax: (604) 757-3158 / (604) 757-4731
http://www.EMSL.com / vancouverlab@EMSL.com

EMSL Canada Order: 691902552 Customer ID: 55VAND29

Customer PO: Project ID:

Attn: Robin Van Driel

VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8 Phone: (778) 879-8009

Fax:

Collected: 10/02/2019 **Received:** 10/03/2019 **Analyzed:** 10/03/2019

Project: IAQ 2

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L):		691902552-0007 N07 150		691902552-0008 N08 150				691902552-0009 N09 150		
Sample Location	CE	EILING - CENTR	AL	OFFICE AREA			OUTSIDE - MAIN ENTRANCE			
Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total	
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-	
Ascospores	3	60	1.8	1	20	13.6	41	880	9	
Aspergillus/Penicillium	8	200	5.9	1	20	13.6	19	410	4.2	
Basidiospores	146	3110	91.2	6	100	68	387	8260	84	
Bipolaris++		-	-	-	-	-	-	-	-	
Chaetomium	-	-	-	-	-	-	-	-	-	
Cladosporium	2	40	1.2	-	-	-	9	200	2	
Curvularia	-	-	-	-	-	-	-	-	-	
Epicoccum	-	-	-	-	-	-	-	-	-	
Fusarium	-	-	-	-	-	-	-	-	-	
Ganoderma	-	-	-	1*	7*	4.8	2	40	0.4	
Myxomycetes++	-	-	-	-	-	-	2	40	0.4	
Pithomyces++	-	-	-	-	-	-	-	-	-	
Rust	-	-	-	-	-	-	-	-	-	
Scopulariopsis/Microascus		-	-	-	-	-	-	-	-	
Stachybotrys/Memnoniella	-	-	-		-	-	-	-	-	
Unidentifiable Spores	-	-	-	-	-	-	-	-	-	
Zygomycetes	-	-	-	-	-	-	-	-	-	
Polythrincium	-	-	-	-	-	-	-	-	-	
Total Fungi	159	3410	100	9	147	100	460	9830	100	
Hyphal Fragment	*	-		-	-	-	-	-	-	
Insect Fragment	-	-	-	-	-	-	-	-	-	
Pollen	•	-	-	-	-	-	-	-	-	
Analyt. Sensitivity 600x	-	21	1-	-	21	-	-	21	-	
Analyt. Sensitivity 300x	-	7*	-	-	7*	-	-	7*	-	
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-	
Fibrous Particulate (1-4)	-	2	-	-	2	-	-	2	-	
Background (1-5)	-	3	-	-:	2	-	-	3	-	

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

Nicole Yeo, Laboratory Manager or other approved signatory

No discernable field blank was submitted with this group of samples.

Samples received in good condition unless otherwise noted. High levels of background particulate can obscure spores and other particulates, leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, polen, liber particle or insect fragment. ""Denotes particles found at 300X." Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains isability limited to cost of analysis. This report relates only to the samples reported above any not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations, Interpretation and use of test results are the responsibility of the client. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report.

Samples analyzed by EMSL Canada Inc. Burnaby, BC CALA Accreditation #A3998

Initial report from: 10/04/2019 11:14:43

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

MIC_M001_0002_0001 1.71 Printed: 10/04/2019 11:14 AM

Page 3 of 4



EMSL Canada Inc.

4506 Dawson Street Burnaby, BC V5C 4C1 Tel/Fax: (604) 757-3158 / (604) 757-4731 http://www.EMSL.com / vancouverlab@EMSL.com EMSL Canada Order: 691902552 Customer ID: 55VAND29

> **Customer PO:** Project ID:

Attn: Robin Van Driel

VanDriel OHS Consulting PO Box 19098 Fourth Ave PO Vancouver, BC V6K 4R8

Phone: (778) 879-8009

Fax:

Collected: 10/02/2019 Received: 10/03/2019 Analyzed: 10/03/2019

Project: IAQ 2

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:		691902552-0010	-	randculates by	Optical Micro	scopy (Methods N	MICKO-30P-201	, MO INI D7391)	
Client Sample ID:		N10							
Volume (L):		150							
Sample Location		CEILING - WEST	г						
Spore Types	Raw Count	Count/m³	% of Total	-	-	1.00	-	-	
Alternaria (Ulocladium)	-	-	-						
Ascospores	9	200	10.9	=		2.			
Aspergillus/Penicillium	8	200	10.9	-		-	-		
Basidiospores	66	1400	76.6	-		-	-		
Bipolaris++	-		-	-		-			
Chaetomium	-	-	-	-		-	-		
Cladosporium	-	-	-	-		-	-		
Curvularia	-	-	-	=		-	-		
Epicoccum	-	-	-	-			-		
Fusarium	1	20	1.1	-		-	-		
Ganoderma	-	-	-			7	e		
Myxomycetes++	1*	7*	0.4	-			-		
Pithomyces++	-	-	-	-		-	-		
Rust	-	-	-	-		-			
Scopulariopsis/Microascus	-		-			-	-		
Stachybotrys/Memnoniella	-	-	-	-		-	-		
Unidentifiable Spores	-	-	-	-		21	<u> </u>		
Zygomycetes	-		-	-		-	-		
Polythrincium	-	-	-	-		-	-		
Total Fungi	85	1827	100	-		-	-		
Hyphal Fragment	-	-	-	-		-	-		
Insect Fragment	-	-	-	-		-	-		
Pollen	-	-	-	-	- 2		-	-	-
Analyt. Sensitivity 600x	-	21	-	-	-	-	-	-	-
Analyt. Sensitivity 300x	-	7*	-	-			-		
Skin Fragments (1-4)	-	1	-	×		-	-		
Fibrous Particulate (1-4)	-	2	-	-		-	-		
Background (1-5)	-	2	-	-		×	-		

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

Nicole Yeo, Laboratory Manager

No discernable field blank was submitted with this group of samples.

Samples received in good condition unless otherwise noted. High levels of background particulate can obscure spores and other particulates, leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, poten, fiber particle or insect fragment. ""Denotes particles found at 300X." Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMB. maintains liablify limited to cost of analysis. This report relates only to the samples reported above any not be regretoed, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations, Interpretation and use of test results are the responsibility of the client. The report reflects the samples as received. When the information supplied by the customer can defect the samples as the extent of the sample and the particular that the center of the extent of the sample and the particular that the center of the extent of the sample and the particular that the center of the extent of the particular that the center of the extent o analyzed. Enroc. Sample collection activities or analytical method limitauous affect the validity of the result, it will be noted on the report

Samples analyzed by EMSL Canada Inc. Burnaby, BC CALA Accreditation #A3998

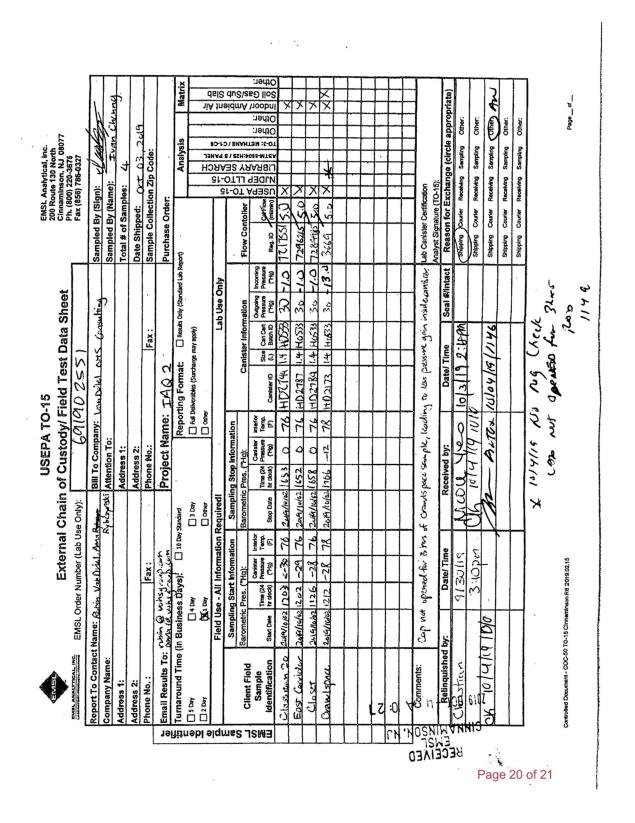
Initial report from: 10/04/2019 11:14:43

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com

MIC_M001_0002_0001 1.71 Printed: 10/04/2019 11:14 AM

Page 4 of 4

Appendix E: Laboratory Chain of Custody Forms



691902551

TO-FM-12 Sample Information Revision 10 Effective Date: May 25, 2018

TO-15 Sample Information

Please fill out this worksheet in addi requested TAT, and provide you with	tion to the Cl h helpful inter	hain of Custo rpretation inf	m. This inform tion.	ation helps	us to best a	nalyze your samples, achieve
Company: VOIN DVIEL OHS	Consultin	19				
Contact Person:		<u> </u>				
Names Trans Clause						
Vame: Ivan Chung						
E-mail: Tuen & vohsgrap	wn					
Additional E-mails:	nsq:onA.	som, while	Johsgranp.	(an		
Telephone #: . 604 379 (847.	J '					
Library Search requested: A library search (aka Tentatively Identified compounds. If you are performing an Ind for your sample.	I Compounds) woor Air Quality	YES [will Identify up t or odor investig	the largest non-	target peaks is recommen	that are not pa	ort of the standard TO-15 list of 74 e you with all available information
Sample Type:			FS 03100AMC033 FG2			
[X] Indoor Air Quality (Home/Office [] IAQ (Industrial) [] Other:)		[] Soil Gas/	Sub Slab		
Sample Description:						
PLEASE NOTE: The result forms we provagency. If you would like that Information	ide will not ind on, please checi	icate whether y	sults have exceed	ded any Expo on forms you	sure Limit crite would like to r	eria established by any regulatory receive.
[] OSHA PELs/NIOSH RELS	combined form					your IAQ sample
[] EPA RSLs - 11/2017; default is THQ 0.1	Residential	Industrial	J TVOC (Library	Search Requi		
[] EPA VISLs - 3/2012	IA/SG] NH DES_WMD		Indoor Air	Soil Gas
[] NJ DEP - 1/2018 - Circle one:	VI-Indoor AQ] Ohio - 4/2013 -			Commercial
[] NC DENR - 4/2014 - Circle one:	Residential	Non-resident] Indiana Dept E	nv Mgmt Scr	eeening Levels	- 3/2016
PA DEP - 11/2016	Indoor Air] Vermont DEP I	ROCP - 4/2012	(soil gas only)	
[] PA DEP - 11/2016: Sub Slab Soll Gas	OR Near Source	Soll Gas] California OEH			
[] CA HHSL - 11/2004 - Circle one:	Indoor Air	Soil Gas] Other; these a			
Please note: There is an additional charge Cinnaminson NJ Laboratory.	e for any of the	tests below. US	O-3 AND ASTM 5	504 analyses	can be perforn	ned from your canister at the
US EPA TO-3 via GC/FID (choose one	below):	,	D5504 vla GC/SCD	(choose on	e below):*	
[] C ₁ -C ₆ hydrocarbons			lfur Scan (H ₂ S, Co			
[] Methane only		1	S only			
*Note: Hold time for sulfur gases on Friday. Analysis performed out of ho	is 1 day from co	ollection. Please ve a notation in	lule your sample port.	collection so	samples are re	ceived in the lab prior to noon
We can provide the following CMS tests for IAQ/Screening purposes ONLY. EM contact your sales rep for the proper me	from your canis	sters at the Cini	on and Huntingto	r these paran	neters (with the	se note these tests are to be used e exception of water vapor); please
	[]02 [
Sample Retention Policy: All canisters your project scope is fully addressed. Co	are guaranteed	to be etapled	every after result	s are reporte	d. Please revie s to hold your o	ew your results promptly to ensure cans must be made through your
customer account representative quick	ly. Thank you.	ראי	MILIWAGA	•		
			SMA ANI:			
		(BECEI			

Controlled Document Confidential Business Information/Property of EMSL Analytical, Inc.

Page 21 of 21

OrderID: 691902552



Microbiology Chain of Custody

EMBL	•	EMSI	L Or	der Numb	er (Lab Use	Only	/):			
EMSE ANALYTICA	AL, INC.		(69190:	2552				PHONE: FAX:	
		OHS Con	ารน	lting					ne Different	
Street:					Third F	arty E	Billing requ	ires written a	uthorization from	third party
City:		State/Province:			Zip/Postal	Code	:	-	Country:	
	:Robin Van D	riel, Anna Rybczy	nski,	Ivan Cheung	Telephone		_			
		m, anna@vohsgroup.com			Fax #:				Purchase Ord	der:
Project Name/Nur	nber: IAQ 2				Please Pro	vide	Results:	: □ Fax	■ Email	
U.S. State Samples		Zip Code :	Samo	le Taken:	1 10400 1 10				☐ Commercial	☐ Residential
		vith EMSL's Terms an			n the Analytica					
		sulfate Preserved								
Public	Water Supply	Samples: Note						to DOH if	required by sta	ite.
				Time (TAT) O	-	_		· Hann	[] 4 Mask	☐ 2 Week
3 Hour	■ 6 Hour	24 Hour		48 Hour	72 Hou	_	<u> </u>	Hour	1 Week	z vveek
M001 Air-O-Cell	M174	MoldSnap	1811	M024 Pseudom			/FT*)	M115 Sew	age Screen - Wat	er (P/A***)
M030 Micro 5		Allergenco-D	\neg	M015 Heterotro	phic Plate Co	unt		M116 Sew	age Screen - Wat age Screen - Swa	er (MPN**)
M041 Fungal Direct I	Examination		\neg	M017 Total Col P/A***)				M013 Sew	age Screen - Swa	b (MFT*)
M168 Pollen ID & En			- 1	M018 Total Col M114 Total Col				M133 Meth (MRSA)	icillin-resistant St	aph. aureus
M280 Dust Characterization Level-1 M281 Dust Characterization Level-2 M005 Viable Fungi- Air Samples (Genus ID & Count) M006 Viable Fungi- Air Samples (Includes Penicillium,			I	(Colilert MPN**)			M031 Rapi	d-growing non-TE	Mycobacteria
			I	M019 Fecal Co M020 Fecal Str		IFT*)			Enumeration toxin Analysis	
		cludes <i>Penicillium,</i> Trys Species ID & Cou	unt)	M029 Enteroco	cci (MFT*)			M044 Grou	p Allergen (Cat, I	Dog, Cockroach,
M007 Culturable fung	gi - Surface Sam	ples (Genus ID & Cou		M129 Enteroco M180 Real Tim			**)	Dust Mite) Other See	Analytical Price	Guide
M008 Culturable fung Penicillium, Asperaill		ipies (includes m, Stachybotrys Spec	ies	Panel				Legionella	Analysis Please	
ID & Count)				M025 Sewage	Screen –Wate	r (MF	1")	Legionella	COC	
M009 Bacteria Cultur M010 Bacteria Coun			ı	*MFT= Membra			ique	•		
M011 Bacteria Coun M012 Pseudomonas				**MPN= Most F ***P/A= Presen		per				
Name of Sampler					Signature o	of Sa	mnler	elvante	hame	
	1				Potable/	Т				; Temperature
Sample #	Sample I	ocation/Description	۱ ۱	Sample Type	NonPotable (only for waters)	•	Test Code	Volume/ Area	Date/Time Collected	('C) (Lab Use Only)
	, , , ,						,	400	9/1/13	
Example A1	Kitchen Sin	k/Tap·	\dashv	Water	Ø P □N	_	M017 `	100 mL	4:00 PM	1
			\dashv			\neg		\vdash	 	
	_					-		_		
	_		\dashv			_		 	 	
	 		-		□P □N	_		 	-	 ,
	 		\dashv	1	==	P		├─	 	
Client Sample # (s):		To	otal # of Samp		\neg	Samples	Received	Chilled? (Yes)	l. / No
Relinguished (Cli	ient). Ivan	Cheuna		Dat	e: 2019/1	0/03	3	Time:	9:00 am	
Received (Lab):	eng. Ivan	Oricarig		Dat		0,00		Time:		
Comments/Speci	al Instruction	s:		Dat	е.			i inite.		
See page 2									Λ	0CT 3 19 2 iner M
									<u> </u>	MIN
Controlled Document –	COC-34 Microbiology	y R7 11/23/2016	F	Page <u>1</u> of <u>2</u>	pages					M
			Pag	e 2 Of	2					

OrderID: 691902552



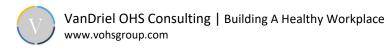
Microbiology Chain of Custody EMSL Order Number (Lab Use Only):

PHONE: FAX:

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Location	/Description	Sample Type	Potable/ NonPotable	Test Code	Volume/ Area	Date/Time Collected	Temperatur (°C) (Lab Use Only
				□ P □NP				. •
				□P □NP				
				□P □NP				
N01	Corridor	- East	Air	□ P □NP	M001	150 L	19/10/02	
N02	Crawlspace -	Stockroom	Air	□ P □NP	M001	150 L	19/10/02	,
N03	Supply Closet -	West	Air	□ P □NP	M001	150 L	19/10/02	
N04	Room 20		Air	□ P □NP	M001	150 L	19/10/02	. ,
N05	Outside - Eas	st entrance	Air	□P □NP	M001	150 L	19/10/02	
N06	Supply clos		Air	□P □NP	M001	150 L	19/10/02	•
N07	Ceiling - Ce	entral	Air	□ P □NP	M001	150 L	19/10/02	
N08	Office area		Air	□P □NP	M001	150 L	19/10/02	
N09	Outside - Ma	n entrance	Air	□P □NP	M001	150 L	19/10/02	
N10	Ceiling - W	est	Air	□ P □NP	M001	150 L	19/10/02	
B04	Ceiling - Ce	entral	Таре	□ P □NP	M041		19/10/02	1 - '
B05	Concrete - crawlspace b	y exposed plywood	Tape	□P □NP	M041		19/10/02	
B06	Wood - crawlspace b	y sump tank pipe	Tape	□P □NP	M041		19/10/02	
				□ P □NP				
				□ P □NP				•
				□ P □NP				
				□ P □NP				
				□ P □NP				
				□ P □NP				•
				□P □NP				٠
				□ P □NP				
comments	Special Instructions	•	_					
omments/	Special Instructions	·	Page 2	2	pages			_

Page 1 Of



Culturable Fungi

0

0

0

M18

10/02/2019

10/02/2019

1.4L VOC

1.4L VOC 1.4L VOC

> 0 0

0 0

0 0

Supply closet west/HD2789 East Corridor/HD2787 Room 20/HD2744

3

10/02/2019 10/02/2019

Appendix F: Air Sample Data Sheet

VanDriel OHS Consulting Building A Healthy Workplace

Air Sampling

Data Sheet

Date 10/02/2019		nous	
Client SCN001 DISTRICT 83	Project Parkview Elementary	Location 605 Parksville Street, Sicamous	Collected By Ivan Cheung
Client	Project	Location	Collected By

								Ave		
Date	Sample ID#	Location/Sample Type/Pump#	Sample	Sample Time	Total Minutes	Flow Rate L/min.	Rate iin.	Flow	Total Volume	Air Contaminant
			Start	Stop		Start	Stop		(r)	
10/02/2019	M10	Supply closet - West	0	15	15	28.3	28.3	28.3	424.5	Culturable Fungi
10/02/2019	M11	Room 20	0	15.08	15.08	28.3	28.3	28.3	426.764	Culturable Fungi
10/02/2019	M12	Outside - East entrance	0	11.767	11.767	28.3	28.3	28.3	333.0061	Culturable Fungi
10/02/2019	M13	Supply closet - East	0	7.25	7.25	28.3	28.3	28.3	205.175	Culturable Fungi
10/02/2019	M14	Crawlspace in stockroom	0	0	0	0	0	0	0	Culturable Fungi
10/02/2019	M15	Ceiling - central section	0	14.45	14.45	28.3	28.3	28.3	408.935	Culturable Fungi
10/02/2019	M16	Outside - Main entrance	0	9.583	9.583	28.3	28.3	28.3	271.1989	Culturable Fungi
10/02/2019	M17	Ceiling - west wing			0			0	0	1.4L VOC

VanDriel OHS Consulting

Air-o-Cell

Air-o-Cell

Air-o-Cell Air-o-Cell Air-o-Cell

Air-o-Cell

Air-o-Cell

Air Contaminant Total Volume 150 150 150 150 150 150 150 150 150 150 0 0 0 0 0 0 Ave. Flow Rate 15 15 15 15 15 15 15 15 15 15 0 0 0 0 0 0 Stop Flow Rate 15 15 15 15 15 15 15 15 15 Start 15 15 15 15 15 15 15 15 15 Minutes Total 10 10 10 10 10 10 10 10 10 10 0 0 0 0 0 VanDriel OHS Consulting Sample Time Stop 10 10 10 10 10 10 10 10 10 Start **Building A Healthy Workplace** 0 0 0 0 Outside - East entrance Crawlspace - stockroom Ceiling - central section Outside - main entrance Location/Sample Type/Pump # Crawlspace/HD2173 Supply closet - West Supply closet - East Ceiling - west wing Corridor - East Office area Room 20 Sample ID# N02 N03 N05 90N N07 **80N 60N** N10 N01 N04 4 10/02/2019 10/02/2019 10/02/2019 10/02/2019 10/02/2019 10/02/2019 10/02/2019 10/02/2019 10/02/2019 10/02/2019 10/02/2019 Date

1.4L VOC

Air-o-Cell Air-o-Cell Air-o-Cell

info@vandrielconsulting.com | www.vandrielconsulting.com

Appendix G: Safety Data Sheets



SAFETY DATA SHEET 1147

IKO SAM ADHESIVE (Retail Version) IKO SAM ADHESIVE (Commercial Version)

SECTION 1 - SUBSTANCE IDENTITY AND COMPANY CONTACT INFORMATION

PRODUCT NAME IKO SAM Adhesive

TRADE NAME High Tack Primer Adhesive

PRODUCT NUMBER 1850032, 1850034

CHEMICAL FAMILY No information available.

PRODUCT USE Primer Adhesive

MANUFACTURER/SUPPLIER BramCal Production Ltd.

305 Rutherford Road Brampton, Ontario

L6W 3R5

WEBSITE www.iko.com

EMERGENCY NUMBER CANUTEC: 1-613-996-6666 (24 hours information only)

SECTION 2 - HAZARD IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

SIGNAL WORD DANGER

SYMBOL(S)







CLASSIFICATION Acute toxicity (Dermal) – Category 5

Aspiration hazard – Category 1
Carcinogenicity – Category 1B
Eye irritation – Category 2A
Flammable liquid – Category 2
Reproductive toxicity – Category 2

Skin irritation – Category 2

Specific target organ toxicity (repeated exposure) – Category 2 Specific target organ toxicity (single exposure) – Category 3

HAZARD STATEMENTS H225 Highly flammable liquid and vapor.

H302+H312 May be harmful if swallowed, in contact with skin or if

inhaled.

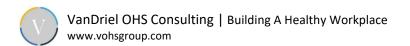
H315+H319 Causes skin and eye irritation. H336 May cause drowsiness or dizziness.

H361 Suspected of damaging fertility or the unborn child.

PRECAUTIONARY P202 Do not handle until all safety precautions have been read and

STATEMENTS understood.

Page 1 of 10





IKO SAM ADHESIVE (Retail Version) IKO SAM ADHESIVE (Commercial Version)

P210 Keep away from heat, sparks, open flames, and hot surfaces. – No smoking.

P240 Ground/bond container and receiving equipment.

P241 Use explosion-proof electrical, ventilating, and lighting equipment.

P242 Use only non-sparking tools.

P243 Take precautionary measures against static discharge.

P260 Do not breathe dust/fume/gas/mist/vapors/spray.

P264 Wash hands and skin thoroughly after handling.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear protective gloves/protective clothing/eye protection/face protection

P301+P310 IF SWALLOWED: Immediately call a POISON CENTRE or doctor.

P302+352 IF ON SKIN: Wash with plenty of water.

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 IF exposed or concerned: Get medical advice or attention.

P331 Do NOT induce vomiting.

P370 In case of fire: Use appropriate foam, carbon dioxide, dry chemical powder to extinguish.

P403+ P235 Store in a well-ventilated place. Keep cool.

P501 Dispose of contents and container in accordance with local, regional, national and international regulations.

NFPA No information available.

HMIS No information available.

SECTION 3 – CHEMICAL COMPOSITION AND DATA ON COMPONENTS

HAZARDOUS CHEMICAL NAME	% (w/w)	CAS NUMBER
Naphtha (petroleum), hydrotreated light	< 35	64742-49-0
Acetone	< 20	67-64-1
Toluene	< 12	108-88-3
Solvent-refined heavy paraffinic petroleum distillate (mildly solvent-refined)	< 2	64742-88-4

Page 2 of 10



IKO SAM ADHESIVE (Retail Version) **IKO SAM ADHESIVE (Commercial Version)**

SECTION 4 - FIRST AID

INHALATION Remove source of exposure or move to fresh air. Get medical advice

or attention if you feel unwell or are concerned.

Drink 1 or 2 glasses of water to dilute. DO NOT INDUCE VOMITING. INGESTION

Consult a physician or Poison Control center immediately. Treat

symptomatically.

SKIN CONTACT Take off contaminated clothing, shoes and leather goods (e.g.

watchbands, belts). Quickly and gently blot or brush away excess chemical. Immediately wash gently and thoroughly with lukewarm, gently flowing water and mild soap for 15-20 minutes. Get medical advice or attention if you feel unwell or are concerned. Safely dispose of contaminated clothing, shoes and leather goods. DO NOT re-use.

EYE CONTACT Quickly and gently blot or brush chemical off the face. Immediately

rinse the contaminated eye(s) with lukewarm, gently flowing water for

15-20 minutes, while holding the eyelid(s) open.

ACUTE AND CHRONIC

SYMPTOMS

No information available.

MEDICAL ATTENTION No information available.

SECTION 5 - FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA Foam, dry chemical, carbon monoxide or any other class B

extinguishing agent.

FIRE FIGHTING Can be ignited by static discharge. May travel a considerable

distance to a source of ignition and flash back to a leak or open container. May accumulate in hazardous amounts in low-lying areas especially inside confined spaces, resulting in a fire and/or health

hazard.

FLAMMABILITY Highly flammable liquid and vapour.

PROPERTIES:

FLASH POINT ≤ -18°C (0°F) (Naphtha (petroleum), hydrotreated light)

FLAMMABLE No information available.

LIMITS IN AIR

AUTO IGNITION 223°C (433°F) (Naphtha (petroleum), hydrotreated light) **TEMPERATURE**

SPECIAL PPE FOR Use extreme caution. Evacuate area. Fight fire from a protected, FIRE-FIGHTERS explosion-resistant location or maximum distance possible. Exposure

Page 3 of 10



IKO SAM ADHESIVE (Retail Version) IKO SAM ADHESIVE (Commercial Version)

to vapors or products of combustion should be avoided. Selfcontained breathing apparatus is recommended. Vapors may form an explosive mixture with air. Closed containers may rupture when exposed to extreme heat.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE MEASURES AND **EMERGENCY PROCEDURES**

Emergency responders: evacuate the area immediately. Isolate the hazard area. Keep out unnecessary and unprotected personnel. Use the personal protective equipment recommended in Section 8, Exposure Control and Personal Protection.

ENVIRONMENTAL PRECAUTIONS

It is good practice to prevent releases into the environment. If the spill is inside a building, prevent product from entering drains, ventilation

systems and confined areas.

SPILL MANAGEMENT

Review Section 7, Handling and Storage, before proceeding with clean-up. Do not use absorbents. Contain spill using noncombustible material such as vermiculite, earth or sand. Dike spilled product to prevent runoff. Review Section 13, Disposal Considerations.

SECTION 7 - HANDLING AND STORAGE

HANDLING PROCEDURE

Avoid breathing in this product. Prevent skin contact. Avoid repeated or prolonged skin contact. Do not swallow. Avoid exposure during pregnancy and while nursing. Only use where there is adequate ventilation. Prevent uncontrolled release of product. Immediately report leaks, spills or failures of the safety equipment (e.g. ventilation system). In the event of a spill or leak, exit the area immediately. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Electrically bond and ground equipment. Ground clips must contact bare metal. Use non-sparking tools. Wear personal protective equipment to avoid direct contact with this chemical. Remove contaminated clothing and protective equipment before entering eating areas or leaving work area. Wash hands thoroughly after handling this product and before eating, using the washroom or leaving work area. Properly dispose of any contaminated items, including shoes that cannot be decontaminated. DO NOT re-use.

STORAGE PRECAUTIONS

Store in an area that is: cool, well ventilated, out of direct sunlight and away from heat and ignition sources. Empty containers may contain hazardous residue. Store separately. Keep closed. Follow all precautions given on this safety data sheet. Comply with all applicable health and safety regulations, fire and building codes.

Page 4 of 10



IKO SAM ADHESIVE (Retail Version) IKO SAM ADHESIVE (Commercial Version)

SECTION 8 - EXPOSURE CONTROL AND PERSONAL PROTECTION

		OCCUPAT	TIONAL EXPOSU	RE LIMITS	
CHEMICAL NAME	ALBERTA	ONTARIO	BRITISH COLUMBIA	OSHA	ACGIH
Acetone	TWA : 500 ppm Ceiling : 750 ppm	TWA : 500 ppm STEL: 750 ppm	TWA : 250 ppm STEL: 500 ppm	TWA: 1000 ppm	TWA: 500 ppm STEL: 750 ppm
Toluene	TWA : 50 ppm	No information available.	No information available.	TWA : 200 ppm Ceiling : 300 ppm	TWA: 20 ppm STEL: 20 ppm
Solvent-refined heavy paraffinic petroleum distillate (mildly solvent-refined)	No information available.	No information available.	No information available.	No information available.	TWA: 5 mg/m ³
Naphtha (petroleum), hydrotreated light		No	information availa	ble.	

ENGINEERING MEASURES

Use local exhaust ventilation, if general ventilation is not adequate to control amount in the air. Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas where this product is used and stored. Control static electricity discharges which include bonding of equipment to ground. Provide eyewash in work area, if contact or splash hazard exists.

PERSONAL PROTECTIVE **EQUIPMENT:**

PROTECTION

RESPIRATORY Wear a NIOSH approved air-purifying respirator with an organic vapour cartridge. Use a NIOSH approved respirator if there is a risk of exposure to dust/fumes at levels exceeding the exposure limits. A NIOSH approved air-purifying respirator with the appropriate chemical cartridges or positive-pressure, air-supplied respirator may be used to reduce exposure. Advice should be sought from respiratory protection specialist.

PROTECTION

SKIN AND BODY Wear chemical protective clothing e.g. gloves, aprons, boots.

EYE PROTECTION Wear chemical safety goggles.

HYGIENE MEASURES Wash exposed skin prior to eating, drinking or smoking and at the

end of each shift. Wash contaminated clothing prior to reuse.

OTHER CONTROLS No information available.

Page 5 of 10



IKO SAM ADHESIVE (Retail Version) IKO SAM ADHESIVE (Commercial Version)

SECTION 9 - PHYSCAL AND CHEMICAL PROPERTIES

APPEARANCE (PHYSICAL

STATE, COLOR etc.)

Yellow viscous liquid

ODOR Pungent

ODOR THRESHOLD 0.071 ppm (tert-Butyl acetate)

PH No information available

MELTING POINT/FREEZING

POINT

Not available (freezing)

INITIAL BOILING POINT AND

BOILING RANGE

56°C (133°F) (Acetone)

FLASH POINT ≤ -18°C (0°F) (Naphtha (petroleum), hydrotreated light)

EVAPORATION RATE 5.6 (estimated) (n-butyl acetate = 1)

FLAMMABILITY Highly flammable liquid and vapour.

UPPER/LOWER

FLAMMABILITY/EXPLOSIVE

LIMITS

8% (Naphtha (petroleum), hydrotreated light) (upper); 1% (Naphtha

(petroleum), hydrotreated light) (lower)

VAPOR PRESSURE ≤ 1800 mm Hg (240 kPa) (Naphtha (petroleum), hydrotreated light)

VAPOR DENSITY No information available

MOLECULAR WEIGHT No information available

SOLUBILITY(IES) Insoluble in water; aromatic hydrocarbons (e.g. toluene).

PARTITION COEFFICIENT: N-

OCTANOL/WATER

No information available

AUTO-IGNITION TEMPERATURE

ATURE .

ILIVIPLINATORL

223°C (433°F) (Naphtha (petroleum), hydrotreated light)

SPECIFIC GRAVITY 0.8

VISCOSITY 275 - 375 centipoises at 25°C (dynamic)

Page 6 of 10



IKO SAM ADHESIVE (Retail Version) IKO SAM ADHESIVE (Commercial Version)

SECTION 10 - STABILITY AND REACTIVITY

REACTIVITY:

CHEMICAL STABILITY Stable under normal conditions of use.

POSSIBILITY OF No information available HAZARDOUS REACTIONS

CONDITIONS TO AVOID Open flames, sparks, static discharge, heat and other ignition

sources.

INCOMPATIBLE MATERIALS Strong oxidizing agents (e.g. perchloric acid)

HAZARDOUS No information available. DECOMPOSITION PRODUCTS

SECTION 11 - TOXICOLOGICAL INFORMATION

ACUTE/CHRONIC TOXICITY

CHEMICAL NAME	LC50	LD50 (ORAL)	LD50 (DERMAL)
Acetone	32000 mg/m ³ (rat) (4-hour exposure)	5800 mg/kg (female rat)	20000 mg/kg (rabbit)
Naphtha (petroleum) hydrotreated light	54 mg/L (rat) (4- hour exposure)	>5000 mg/kg (rat)	4000 mg/kg (rabbit)
Toluene	7585 ppm (rat) (4- hour exposure)	5580 mg/kg (male rat)	12125 mg/kg (rabbit)
Solvent-refined heavy paraffinic petroleum distillate (mildly solvent-refined)	No information available.	> 5000 mg/kg (rat)	> 5000 mg/kg (rabbit)

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE No information available.

PRIMARY ROUTE OF EXPOSURE Inhalation

HEALTH EFFECTS:

EYES Human experience and animal tests show serious eye irritation.

Page 7 of 10



IKO SAM ADHESIVE (Retail Version) IKO SAM ADHESIVE (Commercial Version)

SKIN Skin sensitizer. Human experience and animal tests show mild irritation.

INHALATION Not a respiratory sensitizer.

INGESTION No information available.

STOT (SPECIFIC Inhalation: TARGET ORGAN

TOXICITY) -SINGLE **EXPOSURE**

High concentrations may lead to central nervous system effects (drowsiness, dizziness, nausea, headaches, paralysis, and loss of consciousness and even death). High vapour concentrations are irritating to the eyes, nose, throat, and lungs.

Skin Absorption:

May be harmful if absorbed through skin. May cause skin irritation.

STOT (SPECIFIC TARGET ORGAN TOXICITY) -REPEATED **EXPOSIRE**

Effects similar to STOT (Specific Target Organ Toxicity) - Single Exposure, as described above.

CARCINOGENICITY

CHEMICAL NAME	IARC	ACGIH®	NTP	OSHA
Acetone		A4		
Naphtha (petroleum), hydrotreated light	Group 3			
Toluene	Group 3	A4	Not listed	Not listed
Solvent-refined heavy paraffinic petroleum distillate (mildly solvent- refined)	Group 1			

REPRODUCTIVE TOXICITY:

OF OFFSPRING

DEVELOPMENT Toluene is a developmental toxicity hazard, based on information obtained from animal studies. Fetotoxicity (reduced fetal weight), behavioral effects (effects on learning and memory) and hearing loss (in males) have been observed in the offspring of rats exposed by inhalation to 1200 or 1800 ppm toluene. These effects were observed in the absence of maternal toxicity

AND FERTILITY

SEXUALFUNCTION No information available.

GERM CELL MUTAGENICITY No information available.

Page 8 of 10



IKO SAM ADHESIVE (Retail Version) IKO SAM ADHESIVE (Commercial Version)

SECTION 12 - ECOLOGICAL INFORMATION

ECOTOXICITY

Acute Aquatic Toxicity:

CHEMICAL NAME	LC50 FISH	EC50 CRUSTACEA	ERC50 AQUATIC PLANTS	ERC50 ALGEA
Acetone	No information available.	7630 (Daphnia magna (water flea); 48-hour)	No information available.	No information available.
Toluene	13 mg/L (Lepomis macrochirus (bluegill); 96- hour)	11.5-19.6 mg/L (Daphnia magna (water flea); 48-hour)	No information available.	No information available.
Naphtha (petroleum), hydrotreated light	11 mg/L (Pimephales promelas (fathead minnow))	No information available.	No information available.	No information available.

PERSISTENCE & DEGRADABILITY

No ingredient of this product or its degradation products is known to be highly persistent.

BIODEGRADATION MOBILITY

No information available.

BIOACCUMULATIO N POTENTIAL This product and its degradation products are not expected to bio-accumulate.

SECTION 13 – DISPOSAL CONSIDERATIONS

DISPOSAL RECOMMENDATIONS Dispose of contents and container in accordance with local, regional, national and international regulations. The container for this product can present explosion or fire hazards, even when emptied. Do not cut, puncture, or weld on or near this container. Dispose of or recycle empty containers through an approved waste management facility.

SECTION 14 - TRANSPORT INFORMATION

SHIPPING INFORMATION Adhesives, Flammable, UN1133, Class 3 PG II

Page 9 of 10



IKO SAM ADHESIVE (Retail Version) IKO SAM ADHESIVE (Commercial Version)

SECTION 15 - REGULATIONS

SAFETY, HEALTH AND ENVIRONMENT REGULATIONS

CANADA Domestic Substances List (DSL)/Non-Domestic Substances List (NDSL)

All ingredients are listed on the DSL/NDSL.

USA Toxic Substances Control Act (TSCA) Section 8(b)

All ingredients are listed on the TSCA inventory.

SECTION 16 - OTHER INFORMATION

REVISION DATE OF SDS January 23, 2018

REPLACES THE MSDS/SDS

FROM

June 30, 2017

PREPARED BY HSE department

GENERAL INFORMATION 1-888-766-2468

WEBSITE www.iko.com

OTHER INFO/DISCLAMERS

Read this Safety Data Sheet before handling or disposing of this

roduct.

This product safety information is provided to help our customers with health, safety and/or environmental matters. We have taken reasonable effort to ensure that the test methods and sources for this data are correct and reliable, however, we give no warranty, expressed or implied, regarding its correctness. Since conditions or methods of handling and using this product are beyond our control, we do not assume responsibility and expressly disclaim liability for damages resulting from or connected with the handling, storage, use or disposal of the product.

Page 10 of 10