ENVIRONMENTAL SPECIFICATION

NF91 – McMASTER UNIVERISTY

The SM Group (Ontario) Inc.

SEPTEMBER 2018

REVISION INDEX

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F1731664-0000-ES-0001	00	2018-08-29	Issued to Client

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1 Scope

1.1 Introduction

This Environmental Specification details how environmental protection will be achieved on this project by describing government legislation, and special mitigative procedures to be undertaken. All staff, contractors and sub-contractors on this project are responsible for implementing all components of, and adhering to all requirements of this Environmental Specification.

1.2 Role

McMaster will:

- Communicate environmental specifications to the Contractor as stated in this document;
- Provide all known and relevant site-specific information to the Contractor;
- Obtain environment-related approvals, permits, and authorizations as described in this document.

1.3 In-Service

The required in-service dates for T1 and T2 are June 2019, and September 2019 respectively.

The ready for commissioning date for T1 is May 2019, and for T2 is August 2019.

Failure to meet these ready for commissioning dates may result in cancellation of outages, which can potentially delay the whole project to extent of 9 months or more.

1.4 Contractor

The Contractor must take all reasonable measures and make all reasonable attempts to:

- Prevent adverse environmental impacts by taking preventative measures; mitigating potential effects; remaining vigilant; preparing emergency plans; completing training; wearing appropriate personal protective equipment (“PPE”); using appropriate equipment and materials; eliminating unnecessary contaminants, recycling, etc.;
- Implement immediate mitigation and remedy adverse environmental effects that do occur. This shall include but not be limited to notifying all parties including those performing clean-up at sites where contaminants/pollutants are released into the natural environment; reporting to Ministry of the Environment (“MOE”) and McMaster authority.
- The Contractor must submit an Environmental Management Plan to McMaster prior to commencement of construction. This plan will contain all relevant plans required in this specification.

1.5 Scope of work

The following describes the major activities of the Contract. This description is not intended to be ‘all inclusive’.

- Excavate and remove the equivalent of 200 m^3 of crush stone and dirt for New T1 location and T2 existing location. The excavated material must be considered oil contaminated and required to be treated and disposed of safely. The treatment of the excavated material is the sole responsibility of the Contractor. If the volume of excavation is more or less than provision in this specification, a unit cost in m^3 adjustment is to be proposed by the Contractor.
- In preparation for the containment pits, install and compact, in layers to 98% SPMDD, a 300mm granular A base, approximately 0.5m below the proposed bottom of the pit. The compacted surface will be covered with polyethylene liner over which a 200mm thick reinforced concrete floor and curbing will be installed for the containment pits as shown in the design drawings. Cast in wall a 200mm stainless steel pipe containment outlet.
- Cover the inlet pipe and two 300mm x 200mm openings in the firewall with max. 15mm x 15mm wire mesh to ensure no stone blocks the pipe/wall opening.
- Fill in both containment pits with 19mm-37.5mm crushed fire-quenching stone via slingers to the level of 0.40m approx. below the top of containment pit curb.
- Install two-channel oil-water separator OWS-HT-1 measured internally 8.0mx 2.4mx1.8m with one square concrete riser c/w aluminum hinged access hatch; and 200mm diameter stainless steel drop-leg outlet pipe extended through the access riser to facilitate effluent sampling.
- Connect the containment outlet pipe to the OWS-HT-1 via 150mm diameter stainless steel piping, precast manhole MH-1, a 75mm diameter orifice flow restrictor installed in MH1;
- Connect OWS-HT-1 to the proposed drainage outlet via 150mm diameter HDPE storm sewer.
- Install 150mm diameter perforated HDPE road drain and connect to MH1.
- Remove existing grading of the station down to 200 mm of the finish grading level. Remove any organic component present on the remaining sub base if any. Install 125 mm of granular A in layer 98% SPMDD. Complete the surface of the substation with 80 mm of clear crush stone 3000 ohm/m. Evidence of the stone impedance is required from the contractor;
- Ensure the surface and sub-surface of the station comply with the civil design instructions and slope are complaint.

1.5.1 Vehicle and Equipment Refueling

All vehicle and equipment handling, fuelling and fuel storage are to be conducted in accordance with the Technical Standards and Safety Act (O. Reg. 217/01). The following conditions must be adhered to with respect to vehicle and equipment maintenance and refuelling:

Contractor Responsibility:

- Vehicle and equipment refuelling are to be controlled to prevent any inadvertent discharge of petroleum products.
- Vehicle and equipment refuelling is to be performed at a designated refuelling station.
- No equipment and/or vehicle refuelling or maintenance will be conducted in any of the construction zones, in any of the restoration planting areas or within 100 m of any watercourse or wetland. This includes refuelling and maintenance of small equipment such as chainsaws.

- Fuels, lubricants etc. are to be properly labelled and stored in a designated section of the construction lay-down area. This fuel and lubricant storage area should be placed in the most easily accessible part of the lay-down area.
- Refuelling of small equipment i.e. chain saws, portable generators should be conducted over a portable containment unit.
- Spill kits and other emergency response equipment are to be kept near the fuel/lubricant storage area. All vehicles will be equipped with spill kits.

1.5.2 Result from station Soil Contamination Testing

A sample of the station soil has been tested at two different test pit locations in order to give the contractor an indication of what to expect when excavating in these general areas. These test pit and results are provided in the Appendix 1 attached to this document.

These test results were relatively clean and fall within MOE Guidelines for disposal.

1.5.3 Errosion and Sediment Control

The Contractor will ensure that there is no off-site movement, sedimentation, or contamination occurring from soil excavation activities, and will ensure proper import and storage of clean fill, construction pump-out water, etc. Erosion and sediment control measures will be provided by the Contractor in rough and finished grade.

Sediment and erosion control measures will comply with Ontario Provincial Standard Specifications ("OPSS").

- OPSS 805 - Construction Specification for Temporary Erosion and Sediment Control Measures
- OPSS 182 – General Specification for Environmental Protection for Construction in Waterbodies and on Waterbody Banks
- OPSS 577 - Temporary Erosion and Sediment Control Measures
- OPSS 1860 – Geotextiles

Sediment and erosion control measures will be implemented according to the following Ontario Provincial Standard Drawings ("OPSD") as appropriate:

- OPSD 219.100 – Light-Duty Straw Bale Barrier
- OPSD 219.110 – Light-Duty Silt Fence Barrier
- OPSD 219.130 – Heavy-Duty Silt Fence Barrier
- OPSD 219.231 – Berm Barrier

Stone or other aggregates applied at the site are to contain a minimum of fines to reduce nuisance dust and to reduce potential for off-site movement of sediment. Dust control measures may be required.

Contractor Responsibility:

- Provide a plan for erosion and sediment control.
- To select and/or design and erect sediment and erosion control measures.

- All costs associated with this work are deemed to be included in the contract price.
- To monitor the effectiveness of the control(s).
- To maintain the condition of the control(s).

1.5.4 Soil

Soil management falls into the categories of either disposal or re-use at site. In either case, soils are to be stockpiled on top of an impermeable liner (in such a way that the liner also acts as a berm around the perimeter of the pile) and covered with a tarp until it can be sampled and analyzed.

Soil that cannot be re-used at site will be tested (if required) by the Contractor, and transferred to an appropriate disposal site

Contractor Responsibility:

- Testing of spoil and dried slurry.
- Provide copies of the laboratory test results to McMaster at least two days in advance of disposal.
- Maintain a record of all weigh bills and summarize these on a weekly basis.

1.5.5 Water & Slurry

Pump-out water (groundwater), stormwater or slurry will not be discharged to the ground surface. These materials will be transferred to full containment provided by the Contractor (e.g. plastic storage tank, or open evaporation pit lined with an impermeable membrane). Pump-out water or slurry will be analyzed by the Contractor for potential contaminants prior to disposal. The Contractor will maintain copies of these results for their files.

If laboratory analysis determines that pump-out water is not contaminated above legislated levels, such materials may then be discharged onto the adjacent ground surface, following all procedures below:

- Pump-out/vacuumed waters/slurries shall be discharged in such a manner that the force of discharge does not cause erosion (e.g., using dewatering filter bags, fibre mats, sediment settling ponds, rock pads, etc.).
- Pump-out/vacuumed waters/slurries shall not be discharged directly into or near any form of natural or man-made water body or drainage (e.g., storm sewers, creeks, ponds, etc.).
- Relevant sections of OPSS 518 - Control of Water from Dewatering Operations to protect the environment.

Slurries will be deposited on a slurry drying pad located a minimum of 30 m from watercourses. Water will be sampled by the Contractor, and the results will be maintained on file.

Contractor Responsibility:

- Provide containment measures for groundwater, stormwater and slurry.
- Responsible for the testing of pump-out water and slurry prior to disposal.
- Identify the parameters to be tested. The associated costs are to be included in the contract price.
- Provide a disposal plan with the required support rationale.

- Provide discharge control measures to prevent erosion.
- Maintain copies of the laboratory test results

1.5.6 Backfill

All fill material that is classified as "soil" (>50%, < 20mm particle size) that is imported to the site must be verified as originating from a clean borrow pit. The Contractor must also specify the required tests and inspections for backfill

Contractor Responsibility:

- Responsible for all required tests and inspections for backfill.
- Include backfill testing cost in the contract price.
- Maintain copies of the laboratory results.

1.5.7 Waste management

The Contractor will be responsible for the handling, storage, transport and disposal of waste generated during the course of the Project.

Contractor Responsibility:

- Provide a plan for the testing, handling, storage, transportation and disposal of waste in accordance with all Federal, Provincial and Municipal legislation, as applicable.
- Summarize the weigh bills/bills of lading/manifests on a weekly basis.

1.5.8 Pump-out Waters

Should groundwater be encountered during any excavation, it is imperative that potential contaminants in both "solution" and "suspension" be controlled. Contaminants in suspension MAY be adequately controlled by sediment settling ponds, but those in solution definitely will not. Ground waters/pump-out waters are classed as liquid industrial wastes; they may not be pumped into local Storm or Sanitary sewers (without written permission) and must be managed in accordance with all legislated requirements. The Contractor must arrange for all necessary testing well in advance of pumping operations to have water sample(s) collected and tested.

The Contractor shall arrange for all necessary water testing prior to the commencement of pumping operations. The Contractor must employ suitable methods of removing the sediment including filter bags, and sediment settling structures

Contractor Responsibility:

- Provide a waste management and disposal plan for pump-out waters.
- Undertake the required testing of the pump-out waters.
- Obtain the required permit at the Contractor's cost.
- Maintain records of disposal.
- Manage any sediment removed through appropriate testing and disposal specifications set out herein.
- Include a cost for the disposal of the pump-out waters in the contract price.

1.6 General Waste and Recycling

The Contractor shall ensure that all waste material be separated into hazardous and non-hazardous waste. Each type of waste shall be disposed of in compliance with federal, provincial and municipal requirements. The Contractor will ensure that all wastes are managed in accordance with Regulation 347 – General – Waste Management under the Ontario *Environmental Protection Act*. "Manage" shall include, but shall not be limited to:

- Minimizing wastes produced;
- Recycling all waste where possible;
- Storing wastes securely on-site in appropriate storage containers/facilities;
- Segregating all wastes stored by class;
- Maintaining a current inventory of all waste stored on-site;
- Marking and labeling wastes to be disposed of off-site; and
- Disposing of wastes off-site.

Waste and recycling is to be transported by a licensed carrier and disposed of at a licensed facility, where applicable.

Contractor Responsibility:

- Provide a waste management and disposal plan for general waste and recycling.
- The transportation and disposal of general waste and recycling.
- Provide copies of transport and disposal records to McMaster upon request.
- Include a cost for the disposal of the general waste(s) and recycling in the contract price.

1.7 Site Restoration

The Contractor will ensure site restoration and erosion and sediment control measures within the station property are completed in accordance with Stations Engineering requirements.

All erosion and sediment control measures will be removed by the Contractor, as required.

Appendix 1

Environmental Soil Testing Report

SOIL-MAT ENGINEERS & CONSULTANTS LTD.

www.soil-mat.ca info@soil-mat.ca TF: 800.243.1922

Hamilton: 130 Lancing Drive L8W 3A1 T: 905.318.7440 F: 905.318.7455
Milton: PO Box 40012 Derry Heights PO L9T 7W4 T: 905.875.3228

PROJECT NO.: SM 188597-E

August 23, 2018

MCMASTER UNIVERSITY
1280 Main Street West
Hamilton, Ontario
L8S 4L8

Attention: Mr. Norm Hawton

ENVIRONMENTAL SOIL TESTING
NF 91 TRANSFORMER YARD
MCMASTER UNIVERSITY
HAMILTON, ONTARIO

Dear Mr. Hawton,

As per your request, a representative of SOIL-MAT ENGINEERS & CONSULTANTS LTD. ["SOIL-MAT ENGINEERS"] visited the above noted Site on August 13, 2018. The purpose of our site visit was to secure representative samples of soil from within the transformer yard for submission for analytical testing and to provide interpretation of these test results with respect to the re-use of soil materials at the above noted site.

A representative of SOIL-MAT ENGINEERS collected two representative samples of soil from within the transformer yard. The sampling locations are illustrated on the attached Drawing No. 1, Sample Location Plan. The sampled soils consisted generally of a brown sandy silt. With the exception of a small area of staining at the sampling location of Transformer No. 1 [Sample 'S1'], no evidence of potential impact, i.e. odour, staining, etc., was noted at the time of sampling. The soil samples were submitted to AGAT Laboratories Limited, ["AGAT"], [an accredited Canadian Environmental Laboratory] for select analytical testing including a standard panel of metal and inorganics, volatile organic compounds [VOCs], Petroleum Hydrocarbons [PHCs], Polycyclic Aromatic Hydrocarbons [PAHs], and Polychlorinated Biphenyls [PCBs] parameters.

The laboratory test results received in our Office were compared with the applicable standard from the Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*, as follows:

- **ONTARIO REGULATION 153/04 – TABLE 1**: Full Depth Background Site Condition Standards Residential/Parkland/Institutional and Industrial/Commercial/Community land use.
- **ONTARIO REGULATION 153/04 – TABLE 2**: Full Depth Generic Site Condition Standards Residential/Parkland/Institutional and Industrial/Commercial/Community land use in a potable groundwater condition.
- **ONTARIO REGULATION 153/04 – TABLE 3**: Full Depth Generic Site Condition /Standards Residential/Parkland/Institutional and Industrial/Commercial/Community land use in a non-potable groundwater condition.

The results of this laboratory testing are presented in the attached AGAT Certificate of Analysis [AGAT Work Order Number '18H372877'].

GENERAL COMMENTS

Based on SOIL-MAT ENGINEERS' field observations and the analytical test results from AGAT, SOIL-MAT ENGINEERS has the following comments to offer:

1. The laboratory analytical test results received in our Office indicate that the sampled material is below the Table 1 Standards in all cases for the select tested parameters.
2. When compared to the Table 2 and Table 3 Residential/Parkland/Institutional Standards [Table 2 RPI and Table 3 RPI], less stringent standards, the laboratory analytical test results indicate that sampled material is below the Table 2 and Table 3 RPI Standards in all cases for the select tested parameters.
3. When compared to the Table 2 and Table 3 Industrial/Commercial/Community Standards [Table 2 ICC and Table 3 ICC], less stringent standards, the laboratory analytical test results indicate that sampled material Is below the Table 2 and Table 3 ICC Standards in all cases for the select tested parameters.
4. The samples secured for analytical testing are believed to be representative of the soil conditions. With the exception of a small area of staining at the sampling location around Transformer #1 [Sample 'S1'], no staining or odours were observed during the fieldwork. If any significant changes are noted, i.e., odours, staining etc., SOIL-MAT should be contacted to reassess the environmental characteristics of the soil.

Given the above test results the following disposal options are applicable under Regulation 153/04 [amended by Regulation 511/09 effective July 1, 2011].

- As the test results show the material to be within the Table 1 Standards surplus soil may be reasonably accepted at an off-site property subject to Table 1 requirements [i.e. lands subject to a Record of Site Condition of MOE Certificate of Authorisation]
- As the test results show the material to be within the Table 2 and 3 RPI Standard surplus soil may reasonably be accepted at an RPI property, subject to the approval of the property owner.
- As the test results show the material to be within the Table 2 and 3 ICC Standard surplus soil may reasonably be accepted at an off-site ICC property, subject to the approval of the property owner.
- Excavated soil may be reused on site.
- The descriptions of the sampled material in question are limited to the environmental characteristics of the soil. The suitability of the soil as *engineered fill* should be addressed by this Office prior to such re-use

We trust this is satisfactory for your purposes. Please feel free to contact our Office if you have any questions, or we may be of further service to you.

Yours very truly,
SOIL-MAT ENGINEERS & CONSULTANTS LTD.

Peter Markesic, B.Sc.
Environmental Technician

Stephen R. Sears, B. Eng. Mgmt., P. Eng.
Senior Engineer



Enclosures: Drawing No. 1: Sample Location Plan
AGAT Certificate of Analysis 18H372877

Distribution: MCMASTER UNIVERSITY [1]



LEGEND

S# = Sample Location

NOTES:

1. This map should be read in conjunction with Soil-Mat Engineers and Consultants Ltd. Report No.: SM 188597-E

Soil-Mat
Engineers & Consultants Ltd.

CLIENT

MCMASTER UNIVERSITY

PROJECT TITLE

Environmental Soil Sampling
McMaster University
1280 Main Street West
Hamilton, Ontario

DRAWING TITLE

Study Area View

PROJECT No.	SM 188597-E
DATE	August 2018
CHECKED	SS
DRAWN	PM

FILE NAME

188597 Sample location plan.vsd

DRAWING No. 1

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: SOIL MAT ENGINEERS & CONSULTANTS LT
130 LANCING DRIVE
HAMILTON, ON L8W3A1
(905) 318-7440

ATTENTION TO: Steve Sears

PROJECT: 188597

AGAT WORK ORDER: 18H372877

SOIL ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer

TRACE ORGANICS REVIEWED BY: Oksana Gushyla, Trace Organics Lab Supervisor

DATE REPORTED: Aug 17, 2018

PAGES (INCLUDING COVER): 14

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)
Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Results relate only to the items tested and to all the items tested
All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 18H372877

PROJECT: 188597

CLIENT NAME: SOIL MAT ENGINEERS & CONSULTANTS LT

SAMPLING SITE:

ATTENTION TO: Steve Sears

SAMPLED BY:Peter Markesic

O. Reg. 153(511) - Metals & Inorganics (Soil)

DATE RECEIVED: 2018-08-13

DATE REPORTED: 2018-08-15

		SAMPLE DESCRIPTION:		S1	S2
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2018-08-13	2018-08-13
Parameter	Unit	G / S	RDL	9467112	9467240
Antimony	µg/g	1.3	0.8	<0.8	<0.8
Arsenic	µg/g	18	1	5	5
Barium	µg/g	220	2	37	35
Beryllium	µg/g	2.5	0.5	<0.5	<0.5
Boron	µg/g	36	5	<5	<5
Boron (Hot Water Soluble)	µg/g	NA	0.10	<0.10	<0.10
Cadmium	µg/g	1.2	0.5	<0.5	<0.5
Chromium	µg/g	70	2	14	15
Cobalt	µg/g	21	0.5	8.2	7.8
Copper	µg/g	92	1	33	28
Lead	µg/g	120	1	14	16
Molybdenum	µg/g	2	0.5	<0.5	<0.5
Nickel	µg/g	82	1	17	16
Selenium	µg/g	1.5	0.4	<0.4	<0.4
Silver	µg/g	0.5	0.2	<0.2	<0.2
Thallium	µg/g	1	0.4	<0.4	<0.4
Uranium	µg/g	2.5	0.5	<0.5	<0.5
Vanadium	µg/g	86	1	20	23
Zinc	µg/g	290	5	67	81
Chromium VI	µg/g	0.66	0.2	<0.2	<0.2
Cyanide	µg/g	0.051	0.040	<0.040	<0.040
Mercury	µg/g	0.27	0.10	<0.10	<0.10
Electrical Conductivity	mS/cm	0.57	0.005	0.113	0.106
Sodium Adsorption Ratio	NA	2.4	NA	0.069	0.066
pH, 2:1 CaCl2 Extraction	pH Units		NA	7.44	7.12

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 1: Full Depth Background Site Condition Standards - Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9467112-9467240 EC & SAR were determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil). pH was determined on the 0.01M CaCl2 extract prepared at 2:1 ratio.

Certified By: Nivine Basily

Results relate only to the items tested and to all the items tested

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 18H372877

PROJECT: 188597

CLIENT NAME: SOIL MAT ENGINEERS & CONSULTANTS LT

SAMPLING SITE:

ATTENTION TO: Steve Sears

SAMPLED BY:Peter Markesic

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2018-08-13

DATE REPORTED: 2018-08-17

		SAMPLE DESCRIPTION:		S1	S2
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2018-08-13	2018-08-13
Parameter	Unit	G / S	RDL	9467112	9467240
Naphthalene	µg/g	0.09	0.05	<0.05	<0.05
Acenaphthylene	µg/g	0.093	0.05	<0.05	<0.05
Acenaphthene	µg/g	0.072	0.05	<0.05	<0.05
Fluorene	µg/g	0.12	0.05	<0.05	<0.05
Phenanthrene	µg/g	0.69	0.05	<0.05	<0.05
Anthracene	µg/g	0.16	0.05	<0.05	<0.05
Fluoranthene	µg/g	0.56	0.05	<0.05	<0.05
Pyrene	µg/g	1	0.05	<0.05	<0.05
Benz(a)anthracene	µg/g	0.36	0.05	<0.05	<0.05
Chrysene	µg/g	2.8	0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/g	0.47	0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g	0.48	0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g	0.3	0.05	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	µg/g	0.23	0.05	<0.05	<0.05
Dibenz(a,h)anthracene	µg/g	0.1	0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g	0.68	0.05	<0.05	<0.05
2-and 1-methyl Naphthalene	µg/g	0.59	0.05	<0.05	<0.05
Moisture Content	%		0.1	17.9	13.8
Surrogate	**Unit**	**Acceptable Limits**			
Chrysene-d12	%	50-140		82	79

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 1: Full Depth Background Site Condition Standards - Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9467112-9467240 Results are based on the dry weight of the soil.
Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&j)Fluoranthene isomers because the isomers co-elute on the GC column.

Certified By:

Results relate only to the items tested and to all the items tested

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 18H372877

PROJECT: 188597

CLIENT NAME: SOIL MAT ENGINEERS & CONSULTANTS LT

SAMPLING SITE:

ATTENTION TO: Steve Sears

SAMPLED BY:Peter Markesic

O. Reg. 153(511) - PCBs (Soil)

DATE RECEIVED: 2018-08-13

DATE REPORTED: 2018-08-16

		SAMPLE DESCRIPTION:		S1	S2
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2018-08-13	2018-08-13
Parameter	Unit	G / S	RDL	9467112	9467240
Polychlorinated Biphenyls	µg/g	0.3	0.1	<0.1	<0.1
Surrogate	**Unit**	**Acceptable Limits**			
Decachlorobiphenyl	%	60-140		92	100

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 1: Full Depth Background Site Condition Standards - Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9467112-9467240 Results are based on the dry weight of soil extracted.

Certified By:

Results relate only to the items tested and to all the items tested

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 18H372877

PROJECT: 188597

CLIENT NAME: SOIL MAT ENGINEERS & CONSULTANTS LT

SAMPLING SITE:

ATTENTION TO: Steve Sears

SAMPLED BY:Peter Markesic

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2018-08-13

DATE REPORTED: 2018-08-15

		SAMPLE DESCRIPTION:		S1	S2
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2018-08-13	2018-08-13
Parameter	Unit	G / S	RDL	9467112	9467240
F1 (C6 to C10)	µg/g	25	5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	25	5	<5	<5
F2 (C10 to C16)	µg/g	10	10	<10	<10
F2 (C10 to C16) minus Naphthalene	µg/g		10	<10	<10
F3 (C16 to C34)	µg/g	240	50	<50	<50
F3 (C16 to C34) minus PAHs	µg/g		50	<50	<50
F4 (C34 to C50)	µg/g	120	50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	120	50	NA	NA
Moisture Content	%		0.1	17.9	13.8
Surrogate	**Unit**	**Acceptable Limits**			
Terphenyl	%	60-140		105	80

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 1: Full Depth Background Site Condition Standards - Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9467112-9467240 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 18H372877

PROJECT: 188597

CLIENT NAME: SOIL MAT ENGINEERS & CONSULTANTS LT

SAMPLING SITE:

ATTENTION TO: Steve Sears

SAMPLED BY:Peter Markesic

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2018-08-13

DATE REPORTED: 2018-08-17

		SAMPLE DESCRIPTION:		S1	S2
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2018-08-13	2018-08-13
Parameter	Unit	G / S	RDL	9467112	9467240
Dichlorodifluoromethane	µg/g		0.05	<0.05	<0.05
Vinyl Chloride	ug/g		0.02	<0.02	<0.02
Bromomethane	ug/g		0.05	<0.05	<0.05
Trichlorofluoromethane	ug/g		0.05	<0.05	<0.05
Acetone	ug/g		0.50	<0.50	<0.50
1,1-Dichloroethylene	ug/g		0.05	<0.05	<0.05
Methylene Chloride	ug/g		0.05	<0.05	<0.05
Trans- 1,2-Dichloroethylene	ug/g		0.05	<0.05	<0.05
Methyl tert-butyl Ether	ug/g		0.05	<0.05	<0.05
1,1-Dichloroethane	ug/g		0.02	<0.02	<0.02
Methyl Ethyl Ketone	ug/g		0.50	<0.50	<0.50
Cis- 1,2-Dichloroethylene	ug/g		0.02	<0.02	<0.02
Chloroform	ug/g		0.04	<0.04	<0.04
1,2-Dichloroethane	ug/g		0.03	<0.03	<0.03
1,1,1-Trichloroethane	ug/g		0.05	<0.05	<0.05
Carbon Tetrachloride	ug/g		0.05	<0.05	<0.05
Benzene	ug/g		0.02	<0.02	<0.02
1,2-Dichloropropane	ug/g		0.03	<0.03	<0.03
Trichloroethylene	ug/g		0.03	<0.03	<0.03
Bromodichloromethane	ug/g		0.05	<0.05	<0.05
Methyl Isobutyl Ketone	ug/g		0.50	<0.50	<0.50
1,1,2-Trichloroethane	ug/g		0.04	<0.04	<0.04
Toluene	ug/g		0.05	<0.05	<0.05
Dibromochloromethane	ug/g		0.05	<0.05	<0.05
Ethylene Dibromide	ug/g		0.04	<0.04	<0.04
Tetrachloroethylene	ug/g		0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	ug/g		0.04	<0.04	<0.04
Chlorobenzene	ug/g		0.05	<0.05	<0.05
Ethylbenzene	ug/g		0.05	<0.05	<0.05
m & p-Xylene	ug/g		0.05	<0.05	<0.05

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 18H372877

PROJECT: 188597

CLIENT NAME: SOIL MAT ENGINEERS & CONSULTANTS LT

SAMPLING SITE:

ATTENTION TO: Steve Sears

SAMPLED BY:Peter Markesic

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2018-08-13

DATE REPORTED: 2018-08-17

		SAMPLE DESCRIPTION:		S1	S2
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2018-08-13	2018-08-13
Parameter	Unit	G / S	RDL	9467112	9467240
Bromoform	ug/g		0.05	<0.05	<0.05
Styrene	ug/g		0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	ug/g		0.05	<0.05	<0.05
o-Xylene	ug/g		0.05	<0.05	<0.05
1,3-Dichlorobenzene	ug/g		0.05	<0.05	<0.05
1,4-Dichlorobenzene	ug/g		0.05	<0.05	<0.05
1,2-Dichlorobenzene	ug/g		0.05	<0.05	<0.05
Xylene Mixture	ug/g		0.05	<0.05	<0.05
1,3-Dichloropropene	µg/g		0.04	<0.04	<0.04
n-Hexane	µg/g		0.05	<0.05	<0.05
Surrogate	**Unit**	**Acceptable Limits**			
Toluene-d8	% Recovery	50-140		85	86
4-Bromofluorobenzene	% Recovery	50-140		102	98

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 1: Full Depth Background Site Condition Standards - Ground Water - All Types of Property Uses
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9467112-9467240 The sample was analysed using the high level technique. The sample was extracted using methanol, a small amount of the methanol extract was diluted in water and the purge & trap GC/MS analysis was performed. Results are based on the dry weight of the soil.

Certified By:



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Quality Assurance

CLIENT NAME: SOIL MAT ENGINEERS & CONSULTANTS LT

AGAT WORK ORDER: 18H372877

PROJECT: 188597

ATTENTION TO: Steve Sears

SAMPLING SITE:

SAMPLED BY:Peter Markesic

Soil Analysis

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inorganics (Soil)															
Antimony	9467112	9467112	<0.8	<0.8	NA	< 0.8	109%	70%	130%	81%	80%	120%	77%	70%	130%
Arsenic	9467112	9467112	5	5	NA	< 1	110%	70%	130%	106%	80%	120%	104%	70%	130%
Barium	9467112	9467112	37	37	1.1%	< 2	111%	70%	130%	106%	80%	120%	104%	70%	130%
Beryllium	9467112	9467112	<0.5	<0.5	NA	< 0.5	76%	70%	130%	98%	80%	120%	96%	70%	130%
Boron	9467112	9467112	<5	<5	NA	< 5	73%	70%	130%	97%	80%	120%	85%	70%	130%
Boron (Hot Water Soluble)	9467112	9467112	<0.10	<0.10	NA	< 0.10	110%	60%	140%	85%	70%	130%	88%	60%	140%
Cadmium	9467112	9467112	<0.5	<0.5	NA	< 0.5	103%	70%	130%	99%	80%	120%	100%	70%	130%
Chromium	9467112	9467112	14	14	0.8%	< 2	93%	70%	130%	106%	80%	120%	121%	70%	130%
Cobalt	9467112	9467112	8.2	8.3	0.6%	< 0.5	98%	70%	130%	103%	80%	120%	96%	70%	130%
Copper	9467112	9467112	33	33	0.7%	< 1	95%	70%	130%	108%	80%	120%	100%	70%	130%
Lead	9467112	9467112	14	14	0.5%	< 1	99%	70%	130%	106%	80%	120%	102%	70%	130%
Molybdenum	9467112	9467112	<0.5	<0.5	NA	< 0.5	101%	70%	130%	107%	80%	120%	98%	70%	130%
Nickel	9467112	9467112	17	17	0.4%	< 1	98%	70%	130%	104%	80%	120%	99%	70%	130%
Selenium	9467112	9467112	<0.4	0.4	NA	< 0.4	123%	70%	130%	104%	80%	120%	103%	70%	130%
Silver	9467112	9467112	<0.2	<0.2	NA	< 0.2	100%	70%	130%	104%	80%	120%	98%	70%	130%
Thallium	9467112	9467112	<0.4	<0.4	NA	< 0.4	94%	70%	130%	102%	80%	120%	100%	70%	130%
Uranium	9467112	9467112	<0.5	<0.5	NA	< 0.5	92%	70%	130%	98%	80%	120%	96%	70%	130%
Vanadium	9467112	9467112	20	20	0.9%	< 1	98%	70%	130%	104%	80%	120%	98%	70%	130%
Zinc	9467112	9467112	67	66	0.9%	< 5	98%	70%	130%	107%	80%	120%	109%	70%	130%
Chromium VI	9467618		<0.2	<0.2	NA	< 0.2	73%	70%	130%	99%	80%	120%	96%	70%	130%
Cyanide	9461008		<0.040	<0.040	NA	< 0.040	104%	70%	130%	108%	80%	120%	108%	70%	130%
Mercury	9467112	9467112	<0.10	<0.10	NA	< 0.10	99%	70%	130%	99%	80%	120%	101%	70%	130%
Electrical Conductivity	9467112	9467112	0.113	0.114	0.9%	< 0.005	98%	90%	110%						
Sodium Adsorption Ratio	9467112	9467112	0.069	0.069	0.0%	NA									
pH, 2:1 CaCl2 Extraction	9467618		7.89	7.86	0.4%	NA	99%	80%	120%						

Comments: NA signifies Not Applicable.
Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: Divine Basily

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Quality Assurance

CLIENT NAME: SOIL MAT ENGINEERS & CONSULTANTS LT

PROJECT: 188597

SAMPLING SITE:

AGAT WORK ORDER: 18H372877

ATTENTION TO: Steve Sears

SAMPLED BY:Peter Markesic

Trace Organics Analysis

RPT Date:			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)															
F1 (C6 to C10)	942708		< 5	< 5	NA	< 5	83%	60%	130%	86%	85%	115%	90%	70%	130%
F2 (C10 to C16)	9471134		< 10	< 10	NA	< 10	95%	60%	130%	108%	80%	120%	79%	70%	130%
F3 (C16 to C34)	9471134		< 50	< 50	NA	< 50	99%	60%	130%	103%	80%	120%	87%	70%	130%
F4 (C34 to C50)	9471134		< 50	< 50	NA	< 50	95%	60%	130%	103%	80%	120%	87%	70%	130%
O. Reg. 153(511) - VOCs (Soil)															
Dichlorodifluoromethane	9436592		< 0.05	< 0.05	NA	< 0.05	78%	50%	140%	85%	50%	140%	99%	50%	140%
Vinyl Chloride	9436592		< 0.02	< 0.02	NA	< 0.02	85%	50%	140%	84%	50%	140%	104%	50%	140%
Bromomethane	9436592		< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	86%	50%	140%	94%	50%	140%
Trichlorofluoromethane	9436592		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	95%	50%	140%	116%	50%	140%
Acetone	9436592		< 0.50	< 0.50	NA	< 0.50	92%	50%	140%	79%	50%	140%	105%	50%	140%
1,1-Dichloroethylene	9436592		< 0.05	< 0.05	NA	< 0.05	80%	50%	140%	92%	60%	130%	88%	50%	140%
Methylene Chloride	9436592		< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	105%	60%	130%	114%	50%	140%
Trans- 1,2-Dichloroethylene	9436592		< 0.05	< 0.05	NA	< 0.05	96%	50%	140%	84%	60%	130%	98%	50%	140%
Methyl tert-butyl Ether	9436592		< 0.05	< 0.05	NA	< 0.05	104%	50%	140%	101%	60%	130%	100%	50%	140%
1,1-Dichloroethane	9436592		< 0.02	< 0.02	NA	< 0.02	108%	50%	140%	115%	60%	130%	105%	50%	140%
Methyl Ethyl Ketone	9436592		< 0.50	< 0.50	NA	< 0.50	97%	50%	140%	77%	50%	140%	96%	50%	140%
Cis- 1,2-Dichloroethylene	9436592		< 0.02	< 0.02	NA	< 0.02	75%	50%	140%	108%	60%	130%	76%	50%	140%
Chloroform	9436592		< 0.04	< 0.04	NA	< 0.04	104%	50%	140%	95%	60%	130%	105%	50%	140%
1,2-Dichloroethane	9436592		< 0.03	< 0.03	NA	< 0.03	81%	50%	140%	92%	60%	130%	76%	50%	140%
1,1,1-Trichloroethane	9436592		< 0.05	< 0.05	NA	< 0.05	94%	50%	140%	108%	60%	130%	98%	50%	140%
Carbon Tetrachloride	9436592		< 0.05	< 0.05	NA	< 0.05	81%	50%	140%	73%	60%	130%	76%	50%	140%
Benzene	9436592		< 0.02	< 0.02	NA	< 0.02	74%	50%	140%	81%	60%	130%	81%	50%	140%
1,2-Dichloropropane	9436592		< 0.03	< 0.03	NA	< 0.03	97%	50%	140%	81%	60%	130%	76%	50%	140%
Trichloroethylene	9436592		< 0.03	< 0.03	NA	< 0.03	80%	50%	140%	89%	60%	130%	85%	50%	140%
Bromodichloromethane	9436592		< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	99%	60%	130%	88%	50%	140%
Methyl Isobutyl Ketone	9436592		< 0.50	< 0.50	NA	< 0.50	79%	50%	140%	90%	50%	140%	79%	50%	140%
1,1,2-Trichloroethane	9436592		< 0.04	< 0.04	NA	< 0.04	81%	50%	140%	87%	60%	130%	110%	50%	140%
Toluene	9436592		< 0.05	< 0.05	NA	< 0.05	77%	50%	140%	87%	60%	130%	110%	50%	140%
Dibromochloromethane	9436592		< 0.05	< 0.05	NA	< 0.05	81%	50%	140%	92%	60%	130%	93%	50%	140%
Ethylene Dibromide	9436592		< 0.04	< 0.04	NA	< 0.04	75%	50%	140%	82%	60%	130%	106%	50%	140%
Tetrachloroethylene	9436592		< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	85%	60%	130%	102%	50%	140%
1,1,1,2-Tetrachloroethane	9436592		< 0.04	< 0.04	NA	< 0.04	108%	50%	140%	110%	60%	130%	114%	50%	140%
Chlorobenzene	9436592		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	101%	60%	130%	109%	50%	140%
Ethylbenzene	9436592		< 0.05	< 0.05	NA	< 0.05	76%	50%	140%	79%	60%	130%	112%	50%	140%
m & p-Xylene	9436592		< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	91%	60%	130%	105%	50%	140%
Bromoform	9436592		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	100%	60%	130%	103%	50%	140%
Styrene	9436592		< 0.05	< 0.05	NA	< 0.05	78%	50%	140%	77%	60%	130%	108%	50%	140%
1,1,2,2-Tetrachloroethane	9436592		< 0.05	< 0.05	NA	< 0.05	104%	50%	140%	97%	60%	130%	98%	50%	140%
o-Xylene	9436592		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	101%	60%	130%	100%	50%	140%

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Quality Assurance

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AGAT WORK ORDER: 18H372877

PROJECT: 188597

ATTENTION TO: Steve Sears

SAMPLING SITE:

SAMPLED BY:Peter Markesic

Trace Organics Analysis (Continued)

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
1,3-Dichlorobenzene	9436592		< 0.05	< 0.05	NA	< 0.05	90%	50%	140%	98%	60%	130%	86%	50%	140%
1,4-Dichlorobenzene	9436592		< 0.05	< 0.05	NA	< 0.05	101%	50%	140%	108%	60%	130%	76%	50%	140%
1,2-Dichlorobenzene	9436592		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	99%	60%	130%	106%	50%	140%
1,3-Dichloropropene	9436592		< 0.04	< 0.04	NA	< 0.04	90%	50%	140%	74%	60%	130%	89%	50%	140%
n-Hexane	9436592		< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	84%	60%	130%	96%	50%	140%
O. Reg. 153(511) - PAHs (Soil)															
Naphthalene	9458218		< 0.05	< 0.05	NA	< 0.05	115%	50%	140%	99%	50%	140%	101%	50%	140%
Acenaphthylene	9458218		< 0.05	< 0.05	NA	< 0.05	116%	50%	140%	103%	50%	140%	102%	50%	140%
Acenaphthene	9458218		< 0.05	< 0.05	NA	< 0.05	116%	50%	140%	105%	50%	140%	101%	50%	140%
Fluorene	9458218		< 0.05	< 0.05	NA	< 0.05	114%	50%	140%	96%	50%	140%	103%	50%	140%
Phenanthrene	9458218		< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	85%	50%	140%	80%	50%	140%
Anthracene	9458218		< 0.05	< 0.05	NA	< 0.05	117%	50%	140%	97%	50%	140%	98%	50%	140%
Fluoranthene	9458218		< 0.05	< 0.05	NA	< 0.05	101%	50%	140%	86%	50%	140%	96%	50%	140%
Pyrene	9458218		< 0.05	< 0.05	NA	< 0.05	101%	50%	140%	88%	50%	140%	98%	50%	140%
Benz(a)anthracene	9458218		< 0.05	< 0.05	NA	< 0.05	72%	50%	140%	96%	50%	140%	92%	50%	140%
Chrysene	9458218		< 0.05	< 0.05	NA	< 0.05	103%	50%	140%	87%	50%	140%	95%	50%	140%
Benzo(b)fluoranthene	9458218		< 0.05	< 0.05	NA	< 0.05	80%	50%	140%	80%	50%	140%	80%	50%	140%
Benzo(k)fluoranthene	9458218		< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	92%	50%	140%	95%	50%	140%
Benzo(a)pyrene	9458218		< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	87%	50%	140%	89%	50%	140%
Indeno(1,2,3-cd)pyrene	9458218		< 0.05	< 0.05	NA	< 0.05	108%	50%	140%	92%	50%	140%	97%	50%	140%
Dibenz(a,h)anthracene	9458218		< 0.05	< 0.05	NA	< 0.05	87%	50%	140%	80%	50%	140%	83%	50%	140%
Benzo(g,h,i)perylene	9458218		< 0.05	< 0.05	NA	< 0.05	105%	50%	140%	90%	50%	140%	97%	50%	140%
2-and 1-methyl Naphthalene	9458218		< 0.05	< 0.05	NA	< 0.05	116%	50%	140%	96%	50%	140%	101%	50%	140%
O. Reg. 153(511) - PCBs (Soil)															
Polychlorinated Biphenyls	9466071		< 0.1	< 0.1	NA	< 0.1	104%	60%	140%	94%	60%	140%	98%	60%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By:

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Results relate only to the items tested and to all the items tested

AGAT Laboratories

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Method Summary

CLIENT NAME: SOIL MAT ENGINEERS & CONSULTANTS LT

AGAT WORK ORDER: 18H372877

PROJECT: 188597

ATTENTION TO: Steve Sears

SAMPLING SITE:

SAMPLED BY:Peter Markesic

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Barium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron (Hot Water Soluble)	MET-93-6104	EPA SW 846 6010C; MSA, Part 3, Ch.21	ICP/OES
Cadmium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Copper	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Lead	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Nickel	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Selenium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Silver	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Thallium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Uranium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Zinc	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium VI	INOR-93-6029	SM 3500 B; MSA Part 3, Ch. 25	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE CN-3015 & E 3009 A;SM 4500 CN	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Electrical Conductivity	INOR-93-6036	McKeague 4.12, SM 2510 B	EC METER
Sodium Adsorption Ratio	INOR-93-6007	McKeague 4.12 & 3.26 & EPA SW-846 6010C	ICP/OES
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER

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Method Summary

CLIENT NAME: SOIL MAT ENGINEERS & CONSULTANTS LT

AGAT WORK ORDER: 18H372877

PROJECT: 188597

ATTENTION TO: Steve Sears

SAMPLING SITE:

SAMPLED BY:Peter Markesic

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Acenaphthylene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Acenaphthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Fluorene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Phenanthrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Anthracene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Pyrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benz(a)anthracene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Chrysene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(b)fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(k)fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(a)pyrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Dibenz(a,h)anthracene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(g,h,i)perylene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
2-and 1-methyl Naphthalene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Moisture Content	ORG-91-5106	EPA SW-846 3541 & 8270	BALANCE
Chrysene-d12	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Polychlorinated Biphenyls	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
Decachlorobiphenyl	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method	GC / FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F2 (C10 to C16) minus Naphthalene	VOL-91-5009	CCME Tier 1 Method	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F3 (C16 to C34) minus PAHs	VOL-91-5009	CCME Tier 1 Method	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009		GC/FID
Dichlorodifluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Vinyl Chloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromomethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Acetone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methylene Chloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trans- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl tert-butyl Ether	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Cis- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Chloroform	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Benzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS

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Method Summary

CLIENT NAME: SOIL MAT ENGINEERS & CONSULTANTS LT

AGAT WORK ORDER: 18H372877

PROJECT: 188597

ATTENTION TO: Steve Sears

SAMPLING SITE:

SAMPLED BY:Peter Markesic

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromodichloromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Toluene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Dibromochloromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Chlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromoform	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Styrene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Xylene Mixture	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
n-Hexane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Toluene-d8	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS

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2835 Coopers Avenue
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Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: SOIL-MAT ENGINEERS
Contact: STEVE SEARS
Address: 130 LANCING DR
HAMILTON, ONT L8W 3A1
Phone: 905-318-7440 Fax:
Reports to be sent to:
1. Email: SSEARS@SOILMAT.CA
2. Email: PMARUSSIC@SOILMAT.CA

Project Information:

Project: 185547
Site Location:
Sampled By:
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☐ No ☐
Company:
Contact
Address:
Email:

Regulatory Requirements:

☐ No Regulatory Requirement
Please check all applicable boxes

☒ Regulation 153/04
Table 1 (Indicate One)
☐ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture (Check One) ☐ Coarse ☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region (Indicate One)
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☐ No

Report Guideline on *Certificate of Analysis* ☐ Yes ☐ No

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Laboratory Use Only

Work Order #: 18H372577
Cooler Quantity: MD COOLER
Arrival Temperatures: 16.5 16.2 16.8
Custody Seal Intact: ☐ Yes ☐ No ☐ N/A
Notes: ON ICE

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

5 DAY TAT

Please provide prior notification for rush TAT
** TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics	O. Reg 153: ORPs: B HWS, Cl, CN, Cr6+, EC, FOC, Hg, pH, SAR	Full Metals Scan	Regulation Custom Metals	Nutrients: TP, NH4, TKN, NO3, NO2, NO3+NO2	Volatiles: VOC, BTEX, THM	PHCs F1, F4	ABNs	PAHs	PCBs: Total, Aroclors	Organochlorine Pesticides	TCLP: M&I, VOCs, ABNs, B(a)P, PCBs	Sewer Use
S1	AUG 13/18		7				X					X	X		X	X			
S2	↓						X					X	X		X	X			

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
PETER PMARUSSIC	AUG 13/18	1:30 PM	Daniella Jaic	Aug 13/18	1:30pm

Page 1 of 1

NO T072724

Pink Copy - Client | Yellow Copy - AGAT | White Copy - AGAT