



Soil Engineers Ltd.

CONSULTING ENGINEERS

GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE

100 NUGGET AVENUE, TORONTO, ONTARIO M1S 3A7 • TEL: (416) 754-8515 • FAX: (416) 754-8516

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June 6, 2017, 2017

Reference No. 1704-E066

Page 1 of 2

Vandermeer Homes
c/o C. C. Tatham & Associates Limited
115 Sandford Fleming Drive
Suite 200
Collingwood, Ontario
L9Y 5A6

Attention: Mr. Andrew Schoof

**Re: Results of Chemical Analysis of Soil Samples
Proposed Wasaga Shores Residential Subdivision
Between Betty Boulevard and Shore Lane
Town of Wasaga Beach**

Dear Sir:

As requested, our representative selected four (4) soil samples from geotechnical boreholes drilled at the captioned site between May 4, 2017 and May 8, 2017 for chemical analysis. The purpose of the analysis was to determine the environmental quality of the soil. At the time of sampling, there was no staining or odour emitted from the soil samples.

The soil samples were retrieved from boreholes using a drill rig equipped with a split spoon sampler at the captioned site. The locations of the boreholes are shown on the Sampling Location Plan, Drawing No. 1.

The samples were sent to AGAT Laboratories, accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA), for the analysis of Metals and Inorganic (M&I) parameters.

The analytical results were compared to the Ministry of the Environment and Climate Change (MOECC) Standard Table 1, Full Depth Background Site Condition Standards for Residential/Parkland/Institutional/Industrial/Commercial/Community Uses, in accordance with the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), April 15, 2011 (hereinafter referred to as "Table 1 Standards").

A copy of AGAT Laboratories Certificate of Analysis including the Table 1 Standards is enclosed.

This letter/report/certification was prepared by Soil Engineers Ltd. for the account of the captioned clients and may be relied upon by regulatory agencies. The material in it reflects the writer's best judgement in light of the information available to it at the time of preparation. Any use which a third party makes of this letter/report/certification, or any reliance on or decisions to be made based upon it, are the responsibility of such third parties. Soil Engineers Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this letter/report/certification.



The sampling program is as follows:

Sample Name	Laboratory ID	Sample Depth (mbgs)*	Soil Type	Test Conducted
BH 1/1B	8381689	0.3 - 0.6	Silty Clay	Metals and Inorganics
BH 4/1B	8381693			
BH 6/1	8381694	0.0 - 0.6	Earth Fill	
BH 8/1	8381696			

*meters below ground surface

In reviewing the results of the analysis for the soil sample, the test parameters at the tested location meet Table 1 Standards.

Please be aware that the soil condition may vary between sampling locations. Furthermore, the acceptance of the soil material along with the frequency of sampling and testing are at the discretion of the receiving site.

Should any queries arise, please feel free to contact this office.

Yours very truly,

SOIL ENGINEERS LTD.

Mrinali Kakkar

Mrinali Kakkar, Env. Tech.

AH

Ahmed Hassan, P.Eng.
MK/AH:mk
Encls.



Soil Engineers Ltd.



CONSULTING ENGINEERS
GEO TECHNICAL | ENVIRONMENTAL | HYDROGEOLOGICAL | BUILDING SCIENCE
40 West Beaver Creek Road, Richmond Hill, Ontario L4B 1G5 Tel: (416) 754-8314 Fax: (416) 754-8328

BOREHOLE LOCATION PLAN

DESIGNED	CHECKED	DWG NO. 1	REV
SCALE	NTS	REF. NO. 1704-S066	DATE June 2017



© 2016 Google

Imagery Date: 6/19/2015 17 T 569812.69 m E 4924492.17 m N elev. 186

**CLIENT NAME: SOIL ENGINEERS LIMITED
100 NUGGET AVENUE
TORONTO, ON M1S3A7
(416) 754-8515**

ATTENTION TO: Ahmed Hassan

PROJECT: 1704-E066

AGAT WORK ORDER: 17T214444

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

DATE REPORTED: May 17, 2017

PAGES (INCLUDING COVER): 5

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.

AGAT Laboratories (V1)

Page 1 of 5

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*



Laboratories

Certificate of Analysis

AGAT WORK ORDER: 17T214444

PROJECT: 1704-E066

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

CLIENT NAME: SOIL ENGINEERS LIMITED

SAMPLING SITE:

ATTENTION TO: Ahmed Hassan

SAMPLED BY:

DATE RECEIVED: 2017-05-10		DATE REPORTED: 2017-05-17		
O. Reg. 153(511) - Metals & Inorganics (Soil)				
Parameter	Unit	SAMPLE DESCRIPTION:		BH 6/1 Soil
		BH 1/1B Soil	BH 4/1B Soil	
SAMPLE TYPE:		2017-05-08		2017-05-09
DATE SAMPLED:		8381689		8381694
G/S	RDL	8381693	8381694	8381696
Antimony	µg/g	1.3	<0.8	<0.8
Arsenic	µg/g	18	1	2
Barium	µg/g	220	2	28
Beryllium	µg/g	2.5	0.5	<0.5
Boron	µg/g	36	5	9
Boron (Hot Water Soluble)	µg/g	NA	0.10	0.13
Cadmium	µg/g	1.2	0.5	<0.5
Chromium	µg/g	70	2	11
Cobalt	µg/g	21	0.5	3.4
Copper	µg/g	92	1	7
Lead	µg/g	120	1	4
Molybdenum	µg/g	2	0.5	<0.5
Nickel	µg/g	82	1	8
Selenium	µg/g	1.5	0.4	<0.4
Silver	µg/g	0.5	0.2	<0.2
Thallium	µg/g	1	0.4	<0.4
Uranium	µg/g	2.5	0.5	<0.5
Vanadium	µg/g	86	1	15
Zinc	µg/g	290	5	16
Chromium VI	µg/g	0.66	0.2	<0.2
Cyanide	µg/g	0.051	0.040	<0.040
Mercury	µg/g	0.27	0.10	<0.10
Electrical Conductivity	mS/cm	0.57	0.005	0.144
Sodium Adsorption Ratio	NA	2.4	NA	0.087
pH, 2:1 CaCl2 Extraction	pH Units		7.62	7.49

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

8381689-8381696 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:

Amarjot Bhela



Quality Assurance

CLIENT NAME: SOIL ENGINEERS LIMITED

AGAT WORK ORDER: 17T214444

PROJECT: 1704-E066

ATTENTION TO: Ahmed Hassan

SAMPLING SITE:

SAMPLED BY:

Soil Analysis																
RPT Date: May 17, 2017			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) - Metals & Inorganics (Soil)

Antimony	8381620		<0.8	<0.8	NA	< 0.8	103%	70%	130%	97%	80%	120%	88%	70%	130%
Arsenic	8381620		3	2	NA	< 1	122%	70%	130%	96%	80%	120%	109%	70%	130%
Barium	8381620		30	30	0.0%	< 2	101%	70%	130%	97%	80%	120%	98%	70%	130%
Beryllium	8381620		<0.5	<0.5	NA	< 0.5	84%	70%	130%	100%	80%	120%	84%	70%	130%
Boron	8381620		<5	<5	NA	< 5	96%	70%	130%	105%	80%	120%	92%	70%	130%
Boron (Hot Water Soluble)	8388232		<0.10	<0.10	NA	< 0.10	104%	60%	140%	103%	70%	130%	96%	60%	140%
Cadmium	8381620		<0.5	<0.5	NA	< 0.5	106%	70%	130%	95%	80%	120%	99%	70%	130%
Chromium	8381620		9	9	NA	< 2	100%	70%	130%	99%	80%	120%	106%	70%	130%
Cobalt	8381620		5.9	5.9	0.0%	< 0.5	94%	70%	130%	99%	80%	120%	99%	70%	130%
Copper	8381620		10	9	10.5%	< 1	92%	70%	130%	105%	80%	120%	100%	70%	130%
Lead	8381620		6	6	0.0%	< 1	102%	70%	130%	96%	80%	120%	97%	70%	130%
Molybdenum	8381620		<0.5	<0.5	NA	< 0.5	116%	70%	130%	104%	80%	120%	107%	70%	130%
Nickel	8381620		11	11	0.0%	< 1	96%	70%	130%	101%	80%	120%	99%	70%	130%
Selenium	8381620		<0.4	<0.4	NA	< 0.4	112%	70%	130%	99%	80%	120%	105%	70%	130%
Silver	8381620		<0.2	<0.2	NA	< 0.2	101%	70%	130%	103%	80%	120%	96%	70%	130%
Thallium	8381620		<0.4	<0.4	NA	< 0.4	104%	70%	130%	95%	80%	120%	96%	70%	130%
Uranium	8381620		<0.5	<0.5	NA	< 0.5	101%	70%	130%	92%	80%	120%	104%	70%	130%
Vanadium	8381620		17	16	6.1%	< 1	97%	70%	130%	91%	80%	120%	98%	70%	130%
Zinc	8381620		22	21	NA	< 5	95%	70%	130%	111%	80%	120%	107%	70%	130%
Chromium VI	8388232		<0.2	<0.2	NA	< 0.2	96%	70%	130%	99%	80%	120%	100%	70%	130%
Cyanide	8378695		<0.040	<0.040	NA	< 0.040	97%	70%	130%	108%	80%	120%	91%	70%	130%
Mercury	8381620		<0.10	<0.10	NA	< 0.10	99%	70%	130%	96%	80%	120%	97%	70%	130%
Electrical Conductivity	8388232		0.140	0.143	2.1%	< 0.005	95%	90%	110%	NA			NA		
Sodium Adsorption Ratio	8388232		0.475	0.470	1.1%	NA	NA			NA			NA		
pH, 2:1 CaCl2 Extraction	8378958		8.13	8.17	0.5%	NA	101%	80%	120%	NA			NA		

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:

Amanjot Bhela

Method Summary

CLIENT NAME: SOIL ENGINEERS LIMITED
AGAT WORK ORDER: 17T214444
PROJECT: 1704-E066
ATTENTION TO: Ahmed Hassan
SAMPLING SITE:
SAMPLED BY:

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 6010B	ICP/OES
pH, 2:1 CaCl ₂ Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER



AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.742.5100 Fax: 905.742.5122
web@earth.agatlabs.com

Laboratory Use Only

Work Order #: 17T214444
Cooler Quantity: 8.7 8.9 9.1
Arrival Temperatures: ON ICE
Custody Seal Intact: Yes No N/A
Notes: ON ICE

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 Engineers Ltd
Contact: Andrew Angove
Address: 190 Hurontario Avenue
Scarborough, ON
Phone: _____ Fax: _____
1. Email: Andrew.Angove@soilengineers.com
2. Email: Wg@soilengineers.com

Regulatory Requirements: No Regulatory Requirement
 Regulation 45.3/04
Sewer Use: Regulation 558
Soil Texture (check one): Coarse Fine
MISA: MISA
Region: _____
Soil Texture (check One): Coarse Fine
Table: Residential Industrial/Commercial Agriculture
Prov. Water Quality Objectives (PWQO): Other
Regulation 45.3/04: Regulation 558 CCME

Project Information:
Project: 1704 - Cobb
Site Location: _____
Sampled By: _____
AGAT Quote #: _____
PO: _____

Invoice Information:
Company: _____
Contact: _____
Address: _____
Email: _____
Bill To Same: Yes No

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): _____
Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays
For 'Same Day' analysis, please contact your AGAT CPM

Metals and Inorganics

Field Filtered - Metals, Hg, CM	Y/N
All Metals <input type="checkbox"/> 153 Metals (exc. Hydrides)	
Hydride Metals <input type="checkbox"/> 153 Metals (incl. Hydrides)	
ORPs: <input type="checkbox"/> B-HWS <input type="checkbox"/> Cf <input type="checkbox"/> CN	
Cd <input type="checkbox"/> EC <input type="checkbox"/> FOC <input type="checkbox"/> Hg	
pH <input type="checkbox"/> SAR	
Full Metals Scan	
Regulation/Custom Metals	
Nutrients: <input type="checkbox"/> TP <input type="checkbox"/> NH ₄ <input type="checkbox"/> TKN	
<input type="checkbox"/> NO ₃ <input type="checkbox"/> NO ₂ <input type="checkbox"/> NO _x +NO ₂	
Volatiles: <input type="checkbox"/> VOC <input type="checkbox"/> BTEX <input type="checkbox"/> THM	
CMCME Fractions 1 to 4	
ABNs	
PAHs	
PCBS: <input type="checkbox"/> Total <input type="checkbox"/> Aroclors	
Organochlorine Pesticides	
TCLP: <input type="checkbox"/> M&I <input type="checkbox"/> VOCs <input type="checkbox"/> ABNs <input type="checkbox"/> B(a)P <input type="checkbox"/> PCBS	
Sewer Use	

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

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/Special Instructions
BH 111A	May 9/17	12:15 PM	1	Soil	
BH 4/11B	May 9/17		1		
BH 6/11	May 9/17		1		
BH 5/11	May 9/17		1		

Signature: _____ Date: May 9/17 12:15 PM
Signature: _____ Date: May 9/17 5:15 PM
Signature: _____ Date: May 9/17 5:17 PM
Page 5 of 5