Soil Engineers Ltd.
CONSULTING ENGINEERS
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June 1, 2023 Reference No. 2111-W043

1334281 Ontario Limited
720 Granite Court
Pickering, Ontario
L1W 4A3

Attention: Mr. Domenic Grossi

Re: Groundwater Quality Assessment
Proposed Mid-Rise Residential Development
720 Granite Court
City of Pickering

Dear Sir:

As requested, we have completed a groundwater quality sampling, analysis to evaluate short-term construction dewatering and long-term foundation drainage effluent disposal management options for the proposed development at the captioned site, in the City of Pickering and our assessment and findings are discussed as follows.

Background

Soil Engineers Ltd. has completed a hydrogeological investigation for subject site, SEL Reference No. 2111-W043, dated March 2022 (revision in March 2023). The field work for borehole drilling and monitoring well construction was performed on December 14, 16 and 17, 2021. It consisted of four (4) drilled boreholes (BH) and the installation of three (3) monitoring wells (MW), one (1) within each of three (3) selected boreholes drilled at the locations, shown on Drawing No. 1. All three (3) monitoring wells were installed to a depth of 9.0 m below ground surface. This study has revealed that beneath a layer of topsoil, the native subsoils underlying the site consist of sandy silt till. The detailed borehole logs, showing the monitoring well installation details are provided in Figure 1.

Groundwater Monitoring

Groundwater levels, beneath the site were recently recorded on two (2) occasions, on May 8, 2023 (Monitoring Well Development), and again, on May 16, 2023 (Groundwater Sampling). The groundwater levels and their corresponding elevations are summarized in Table 1, presented below:

Table 1 - Water Level Measurements

Well ID		May 08, 2023	May 16, 2023
BH/MW 1	mbgs	6.83	6.82
	masl	97.67	97.68
BH/MW 2	mbgs	7.23	8.76
	masl	97.17	95.64
BH/MW 4	mbgs	1.68	7.05
	masl	102.31	96.94

Notes: mbgs—meter below ground surface masl—meter above sea level

Groundwater Quality

To address the approval requirements for any proposed short-term construction dewatering and any long-term foundation drainage effluent discharge disposal requirements, or for the disposal of any generated, temporary groundwater effluent from construction dewatering to the Region of Durham sewer system, a groundwater sampling and analysis assessment is required to confirm that the groundwater quality will meet the Region of Durham storm and sanitary sewer use disposal standards. As such, one (1) groundwater sample, comprised of both unfiltered and filtered groundwater samples were collected for analysis from the on-site monitoring well at BH/MW 4 on May 16, 2023 using a dedicated sampling bailer. The monitoring well was purged on May 8, 2023 of a minimum of three (3) casing volumes of standing groundwater, prior to groundwater sample collection. Upon sampling, all of the sample bottles were placed in ice and packed in a cooler at about 4^{o} C for shipment to the analytical laboratory. The groundwater samples were submitted for analysis, for comparison evaluation of the analysis results against the Region of Durham storm and sanitary sewer use by-law standards. Sample analysis was performed by SGS Environmental Services, which is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA). Results for the analysis are provided in Appendix, with a discussion of the findings and comparison evaluation of the results, provided below. The chain of custody number for the lab sample submissions is 031764 and the SGS report number is CA40228-MAY23 R1. The site plan, showing the approximate sampling points (monitoring well at BH/MW4) is provided on Drawing No. 1.

As per the standard practice for Region of Durham storm and sanitary sewer use, a full suite of submitted samples, consisting of unfiltered groundwater underwent analysis, with results presented as totals for various parameters analyzed. A second set of selected samples underwent field filtration, during sample collection, prior to analysis for Metals and Total Phosphorous. This was performed in order to evaluate the potential source for any potentially elevated Metals and Phosphorous in a dissolved form, which may have been indicated from the results of the total analysis (unfiltered samples).

Comparison Evaluation against Region of Durham Sanitary and Storm Sewer Use (Unfiltered-Groundwater)

The analytical results for the unfiltered groundwater showed three (3) exceedances of the Region of Durham Storm Sewer Use by-law standards. The exceedances, together with the storm sewer use limits criteria, are presented in Table 2.

Table 2 - Groundwater Quality Results (Unfiltered-Groundwater- Totals)

Parameter	Groundwater Quality Results (Unfiltered Groundwater) (mg/L)	Region of Durham Sanitary Sewer Use Limit Standards (mg/L)	Region of Durham Storm Sewer Use Limit Standards (mg/L)
	BH/MW 4		
Total Suspended Solids (TSS)	17	350	15
Manganese (Total)	0.381	5	0.15
Phosphorus (Total)	0.504	10	0.4

As shown above, the analysis results for the unfiltered groundwater obtained from BH/MW 4, indicates that the concentrations for all the parameters, except Total Suspended Solids (TSS), Manganese (Total) and Phosphorous (Total), are within, or meet the Region of Durham Storm Sewer Use limit standards, with the concentrations for all the parameters meeting the Region of Durham Sanitary Sewer Use limits.

The results suggest that any dewatering or long-term foundation drainage effluent should be acceptable for disposal to the Region of Durham Sanitary Sewer with some pre-treatment being implemented to meet Region of Durham Storm Sewer Use standards.

Comparison Evaluation against Region of Durham Storm and Sanitary Sewer Use (Filtered-Groundwater)

The results of analysis for groundwater at BH/MW 4 for the filtered samples, for selected parameters, indicates that all of the tested parameters (phosphorus and metals) meet the Region of Durham Storm and Sanitary Sewer disposal standards. The filtered sample shows

that the Manganese and Phosphorous concentrations are within and meet the storm sewer limits, exhibiting a decrease of 0.37393 mg/L and 0.497 mg/L, respectively, compared with the unfiltered groundwater sample results, suggesting that the elevated concentrations for the said parameters can be partially attributed to the presence of suspended solids resulting in concentrations being above the Storm sewer-use standards.

The results of the filter sampling and analysis would mimic the discharged water quality after having gone through pre-treatment to remove any levels of elevated suspended solids. The levels of manganese and phosphorus in the filtered sample meet applicable storm sewer use standards, suggesting that the suspended solids is the primary source for the elevated phosphorus and manganese that were determined from the analysis of the Total (unfiltered) sample.

Discussion

The results suggest that any construction dewatering effluent should be acceptable for disposal discharge to the Region of Durham Storm sewer after undergoing minimal pre-treatment to lower concentrations of Total Suspended Solids (TSS), Manganese (total) and Phosphorous (total).

The final designs for any construction dewatering effluent pre-treatment system would be the responsibility of contractors responsible for construction and/or the mechanical engineer for any long-term drainage effluent pre-treatment.

Potential scour erosion and sedimentation impacts associated with construction are anticipated, and as such, a mitigation program may be required to minimize any potential erosion and sediment solids impacts to the adjacent natural features. Dewatering should be carried out in accordance with OPSS 518 and OPSS 805. Appropriate erosion and sediment control measures should be installed where appropriate. These measures would likely include placement of straw bales, silt fences and coir matting to filter out any release of sediment and to prevent scour erosion. Other methods of filtration, or sedimentation detention may be installed, if required to achieve surface water quality objectives. No dewatering effluent should be directly released to a natural water course with the discharge location being set back at least 30 m from the receiving water course with proper erosion and sediment control measures being implemented at the point of discharge.

The final design for any dewatering effluent pre-treatment system will be the responsibility of the contractors responsible for construction. The final design for any short-term dewatering or any long-term foundation drainage effluent pre-treatment system, will be the responsibility of

the mechanical engineer and or pre-treatment system engineers responsible for the design of the short-term dewatering or long-term foundation drainage effluent pre-treatment system.

A dewatering plan, if needed, may need to be coordinated with the civil engineer for the project who would confirm the discharge location and capacity of the receiving catch basin, with the dewatering plan being finalized once the discharge location and receiving catch basin capacity have been confirmed.

It is recommended that the monitoring wells be decommissioned in accordance with O. Regulation 903 in advance of earthworks if they are no longer needed.

We trust that this correspondence will address your current needs and ask that you contact the undersigned should you have any questions or require additional information.

Yours truly,
SOIL ENGINEERS LTD.

Harshpinder Brar

Harshpinder Singh Brar, M.Eng., E.I.T

Gavin O'Brien, M.Sc., P.Geo.
HB/GO

PROFESSIONAL GEOSCIENTIST
GAVIN R. O'BRIEN
PRACTISING MEMBER
1267
ONTARIO

ENCLOSURES

Borehole Log (BH/MW 4)	Figure No. 1
Borehole and Monitoring Well Location Plan	Drawing No. 1
Water Quality Certification of Analyses	Appendix

JOB NO.: 2111-W043 # LOG OF BOREHOLE: BH/MW 4 **FIGURE NO.:** 1

PROJECT DESCRIPTION: Proposed Mid-Rise Residential Development **METHOD OF BORING:** Flight Auger

PROJECT LOCATION: 720 Granite Court, City of Pickering **DRILLING DATE:** December 14, 2021

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
104.0	Ground Surface							
0.0	**25 cm TOPSOIL**	1	DO	12	0		21	
	Very dense — weathered **SANDY SILT TILL** a trace of gravel occ. silty clay layers, cobbles and boulders	2	DO	79/8	1		10	
		3	DO	50/4			7	
		4	DO	50/4	2		7	
		5	DO	50/4	3		6	
	— — brown grey	6	DO	50/3	4		6	
		7	DO	50/3	5		5	
		8	DO	50/2	6		6	
		9	DO	50/2	7		5	
		10	DO	50/4	8		6	
91.7		11	DO	50/4	9		5	
12.3	**END OF BOREHOEL** Installed 50 mm Ø monitoring well to 9.0 m completed with 3.1 m screen Sand backfill from 5.5 to 9.0 m Bentonite seal from 0.0 m to 5.5 m Provided with a momument steel casing				10 11 12 13 14 15			

W.L. @ El. 98.49 m on Jan 07, 2022
W.L. @ El. 99.21 m on Jan 19, 2022
W.L. @ El. 100.38 m on Feb 01, 2022

Soil Engineers Ltd.

N

Approximate Boundary of Subject Site

Borehole

Borehole with Monitoring Well

Major Road

Local Road

Railway

Soil Engineers Ltd.

Title: Borehole and Monitoring Well Location Plan

Project:

Hydrogeological Assessment
Proposed Mid-Rise Residential Development
720 Granite Court
City of Pickering

Reference No. 2111-W043

Date: January 19, 2022

Scale:

0 5 10 20 30 40 50

Metres

Drawing No. 1

FINAL REPORT

CA40228-MAY23 R1

2111-W043, 720 Granite Court, City of Pickering

Prepared for

Soil Engineers Ltd.

FINAL REPORT

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Soil Engineers Ltd.	Project Specialist	Brad Moore Hon. B.Sc
		Laboratory	SGS Canada Inc.
Address	90 West Beaver Creek Rd Richmond, ON M1S 3A7. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Gurkaranbir Singh	Telephone	705-652-2143
Telephone	519-731-6442	Facsimile	705-652-6365
Facsimile		Email	brad.moore@sgs.com
Email	gurkaranbir.singh@soilengineersltd.com	SGS Reference	CA40228-MAY23
Project	2111-W043, 720 Granite Court, City of Pickering	Received	05/17/2023
Order Number		Approved	05/29/2023
Samples	Ground Water (2)	Report Number	CA40228-MAY23 R1
		Date Reported	05/29/2023

COMMENTS

RL - SGS Reporting Limit

Nonylphenol Ethoxylates is the sum of nonylphenol monoethoxylate and nonylphenol diethoxylate.

Total PAH is the sum of anthracene, benzo(a)pyrene, benzo(a)anthracene, benzo(e)pyrene, benzo(b,j)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, dibenzo(a,i)pyrene, dibenzo(a,j)acridine, 7H-dibenzo(c,g)carbazole, fluoranthene, indeno(1,2,3-c,d)pyrene, perylene, phenanthrene and pyrene..

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present: Yes
Custody Seal Present: Yes

Chain of Custody Number: 031764

SIGNATORIES

Brad Moore Hon. B.Sc

TABLE OF CONTENTS

Client: Soil Engineers Ltd.
Project: 2111-W043, 720 Granite Court, City of Pickering
Project Manager: Gurkaranbir Singh
Samplers: Gurkaranir Singh

MATRIX: WATER

L1 = SANSEW / WATER / - - Durham Sewer Use ByLaw - Sanitary Sewer Discharge - BL_55_2013

L2 = SANSEW / WATER / - - Durham Sewer Use ByLaw - Storm Sewer Discharge - BL_55_2013

					Sample Number	8	9
					Sample Name	BH/MW4	BH/MW4 Dissolved
					Sample Matrix	Ground Water	Ground Water
					Sample Date	16/05/2023	16/05/2023
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	**Result**
General Chemistry						
Biochemical Oxygen Demand (BOD5)	mg/L	2	300	15	< 4 ↑	---
Total Suspended Solids	mg/L	2	350	15	17	---
Total Kjeldahl Nitrogen	as N mg/L	0.5	100	1	< 0.5	---
Metals and Inorganics						
Sulphate	mg/L	2	1500		240	---
Cyanide (total)	mg/L	0.01	2	0.02	< 0.01	---
Fluoride	mg/L	0.06	10		0.34	---
Aluminum (total)	mg/L	0.001	50		7.66	0.011
Antimony (total)	mg/L	0.0009	5		< 0.0009	< 0.0009
Arsenic (total)	mg/L	0.0002	1	0.02	0.0067	0.0010
Cadmium (total)	mg/L	0.000003	0.7	0.008	0.000135	0.000072
Chromium (total)	mg/L	0.00008	2	0.08	0.0246	0.00021
Cobalt (total)	mg/L	0.000004	5		0.00485	0.000087
Copper (total)	mg/L	0.0002	3	0.05	0.0120	0.0008
Lead (total)	mg/L	0.00009	1	0.12	0.00693	< 0.00009
Manganese (total)	mg/L	0.00001	5	0.15	0.381	0.00707
Molybdenum (total)	mg/L	0.00004	5		0.0301	0.0311
Nickel (total)	mg/L	0.0001	2	0.08	0.0131	0.0010
Phosphorus (total)	mg/L	0.003	10	0.4	0.504	0.007
Selenium (total)	mg/L	0.00004	1	0.02	0.00070	0.00046
Silver (total)	mg/L	0.00005	5	0.12	< 0.00005	< 0.00005

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				Sample Number	8	9
				Sample Name	BH/MW4	BH/MW4 Dissolved
				Sample Matrix	Ground Water	Ground Water
				Sample Date	16/05/2023	16/05/2023
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	**Result**
Metals and Inorganics (continued)						
Tin (total)	mg/L	0.00006	5		0.00055	0.00084
Titanium (total)	mg/L	0.00005	5		0.310	0.00123
Zinc (total)	mg/L	0.002	2	0.04	0.026	0.003
Microbiology						
E. Coli	cfu/100mL	0		200	0	---
Nonylphenol and Ethoxylates						
Nonylphenol	mg/L	0.001	0.02		< 0.001	---
Nonylphenol Ethoxylates	mg/L	0.01	0.2		< 0.01	---
Nonylphenol diethoxylate	mg/L	0.01			< 0.01	---
Nonylphenol monoethoxylate	mg/L	0.01			< 0.01	---
Oil and Grease						
Oil & Grease (total)	mg/L	2			< 2	---
Oil & Grease (animal/vegetable)	mg/L	4	150		< 4	---
Oil & Grease (mineral/synthetic)	mg/L	4	15		< 4	---

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				Sample Number	8	9
				Sample Name	BH/MW4	BH/MW4 Dissolved
				Sample Matrix	Ground Water	Ground Water
				Sample Date	16/05/2023	16/05/2023
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	**Result**
Other (ORP)						
pH	No unit	0.05	10.5	9	8.32	---
Mercury (total)	mg/L	0.00001	0.01	0.0004	< 0.00001	---
PCBs						
Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.0001	0.001	0.0004	< 0.0001	---
Phenols						
4AAP-Phenolics	mg/L	0.002	1	0.008	< 0.002	---
SVOCs						
di-n-Butyl Phthalate	mg/L	0.002	0.08	0.015	< 0.002	---
Bis(2-ethylhexyl)phthalate	mg/L	0.002	0.012	0.0088	< 0.002	---
VOCs						
Chloroform	mg/L	0.0005	0.04	0.002	< 0.0005	---
1,2-Dichlorobenzene	mg/L	0.0005	0.05	0.0056	< 0.0005	---
1,4-Dichlorobenzene	mg/L	0.0005	0.08	0.0068	< 0.0005	---
cis-1,2-Dichloroethene	mg/L	0.0005			< 0.0005	---
trans-1,3-Dichloropropene	mg/L	0.0005	0.14	0.0056	< 0.0005	---
Methylene Chloride	mg/L	0.0005	2	0.0052	< 0.0005	---
1,1,2,2-Tetrachloroethane	mg/L	0.0005	1.4	0.017	< 0.0005	---
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	1	0.0044	< 0.0005	---
Trichloroethylene	mg/L	0.0005	0.4	0.008	< 0.0005	---
Methyl ethyl ketone	mg/L	0.02	8		< 0.02	---
Styrene	mg/L	0.0005	0.2		< 0.0005	---

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				Sample Number	8	9
				Sample Name	BH/MW4	BH/MW4 Dissolved
				Sample Matrix	Ground Water	Ground Water
				Sample Date	16/05/2023	16/05/2023
Parameter	**Units**	**RL**	**L1**	**L2**	**Result**	**Result**
VOCs (continued)						
VOCs - BTEX						
Benzene	mg/L	0.0005	0.01	0.002	< 0.0005	---
Ethylbenzene	mg/L	0.0005	0.16	0.002	< 0.0005	---
Toluene	mg/L	0.0005	0.27	0.002	< 0.0005	---
Xylene (total)	mg/L	0.0005	1.4	0.0044	< 0.0005	---
m-p-xylene	mg/L	0.0005			< 0.0005	---
o-xylene	mg/L	0.0005			< 0.0005	---

EXCEEDANCE SUMMARY

Parameter	Method	Units	Result	SANSEW / WATER / - - Durham Sewer Use ByLaw - Sanitary Sewer Discharge - BL_55_2013 L1	SANSEW / WATER / - - Durham Sewer Use ByLaw - Storm Sewer Discharge - BL_55_2013 L2
BH/MW4					
Total Suspended Solids	SM 2540D	mg/L	17		15
Manganese	SM 3030/EPA 200.8	mg/L	0.381		0.15
Phosphorus	SM 3030/EPA 200.8	mg/L	0.504		0.4

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 375.4 | Internal ref.: ME-CA-[ENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphate	DIO5097-MAY23	mg/L	2	<2	2	20	103	80	120	102	75	125

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-[ENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0040-MAY23	mg/L	2	< 2	1	30	115	70	130	NV	70	130

Cyanide by SFA

Method: SM 4500 | Internal ref.: ME-CA-[ENVISFA-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Cyanide (total)	SKA0202-MAY23	mg/L	0.01	<0.01	ND	10	95	90	110	90	75	125

QC SUMMARY

Fluoride by Specific Ion Electrode

Method: SM 4500 I Internal ref.: ME-CA-[ENVIEWL-LAK-AN-014

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Fluoride	EWL0464-MAY23	mg/L	0.06	<0.06	ND	10	103	90	110	96	75	125

Mercury by CVAAS

Method: EPA 7471A/SM 3112B I Internal ref.: ME-CA-[ENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0037-MAY23	mg/L	0.00001	< 0.00001	ND	20	107	80	120	112	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0155-MAY23	mg/L	0.00005	<0.00005	ND	20	102	90	110	96	70	130
Aluminum (total)	EMS0155-MAY23	mg/L	0.001	<0.001	3	20	98	90	110	127	70	130
Arsenic (total)	EMS0155-MAY23	mg/L	0.0002	<0.0002	ND	20	101	90	110	98	70	130
Cadmium (total)	EMS0155-MAY23	mg/L	0.000003	<0.000003	0	20	102	90	110	105	70	130
Cobalt (total)	EMS0155-MAY23	mg/L	0.000004	<0.000004	2	20	98	90	110	101	70	130
Chromium (total)	EMS0155-MAY23	mg/L	0.00008	<0.00008	ND	20	99	90	110	101	70	130
Copper (total)	EMS0155-MAY23	mg/L	0.0002	<0.0002	2	20	101	90	110	116	70	130
Manganese (total)	EMS0155-MAY23	mg/L	0.00001	<0.00001	1	20	102	90	110	100	70	130
Molybdenum (total)	EMS0155-MAY23	mg/L	0.00004	<0.00004	ND	20	98	90	110	97	70	130
Nickel (total)	EMS0155-MAY23	mg/L	0.0001	<0.0001	ND	20	102	90	110	93	70	130
Lead (total)	EMS0155-MAY23	mg/L	0.00009	<0.00009	ND	20	90	90	110	100	70	130
Phosphorus (total)	EMS0155-MAY23	mg/L	0.003	<0.003	ND	20	99	90	110	NV	70	130
Antimony (total)	EMS0155-MAY23	mg/L	0.0009	<0.0009	ND	20	105	90	110	117	70	130
Selenium (total)	EMS0155-MAY23	mg/L	0.00004	<0.00004	4	20	101	90	110	107	70	130
Tin (total)	EMS0155-MAY23	mg/L	0.00006	<0.00006	ND	20	103	90	110	NV	70	130
Titanium (total)	EMS0155-MAY23	mg/L	0.00005	<0.00005	17	20	104	90	110	NV	70	130
Zinc (total)	EMS0155-MAY23	mg/L	0.002	<0.002	ND	20	97	90	110	104	70	130

QC SUMMARY

Microbiology

Method: SM 9222D | Internal ref.: ME-CA-IENVIMIC-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
E. Coli	BAC9327-MAY23	cfu/100mL	-	ACCEPTED	ACCEPTED							

Nonylphenol and Ethoxylates

Method: ASTM D7065-06 | Internal ref.: ME-CA-IENVIGC-LAK-AN-015

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nonylphenol diethoxylate	GCM0360-MAY23	mg/L	0.01	<0.01			82	55	120			
Nonylphenol Ethoxylates	GCM0360-MAY23	mg/L	0.01	0								
Nonylphenol monoethoxylate	GCM0360-MAY23	mg/L	0.01	<0.01			89	55	120			
Nonylphenol	GCM0360-MAY23	mg/L	0.001	<0.001			85	55	120			

QC SUMMARY

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (total)	GCM0405-MAY23	mg/L	2	<2	NSS	20	99	75	125			

Oil & Grease-AV/MS

Method: MOE E3401/SM 5520F | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (animal/vegetable)	GCM0405-MAY23	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0405-MAY23	mg/L	4	< 4	NSS	20	NA	70	130			

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0469-MAY23	No unit	0.05	NA	0		100			NA		

QC SUMMARY

Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0194-MAY23	mg/L	0.002	<0.002	ND	10	92	80	120	101	75	125

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A | Internal ref.: ME-CA-[ENV]GC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Polychlorinated Biphenyls (PCBs) - Total	GCM0404-MAY23	mg/L	0.0001	<0.0001	NSS	30	95	60	140	NSS	60	140

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Bis(2-ethylhexyl)phthalate	GCM0364-MAY23	mg/L	0.002	< 0.002	NSS	30	120	50	140	NSS	50	140
di-n-Butyl Phthalate	GCM0364-MAY23	mg/L	0.002	< 0.002	NSS	30	119	50	140	NSS	50	140

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0523-MAY23	mg/L	2	< 2	0	10	98	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0220-MAY23	as N mg/L	0.5	<0.5	ND	10	97	90	110	102	75	125

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,2,2-Tetrachloroethane	GCM0334-MAY23	mg/L	0.0005	<0.0005	ND	30	99	60	130	101	50	140
1,2-Dichlorobenzene	GCM0334-MAY23	mg/L	0.0005	<0.0005	ND	30	105	60	130	97	50	140
1,4-Dichlorobenzene	GCM0334-MAY23	mg/L	0.0005	<0.0005	ND	30	101	60	130	92	50	140
Benzene	GCM0334-MAY23	mg/L	0.0005	<0.0005	ND	30	102	60	130	91	50	140
Chloroform	GCM0334-MAY23	mg/L	0.0005	<0.0005	ND	30	99	60	130	91	50	140
cis-1,2-Dichloroethene	GCM0334-MAY23	mg/L	0.0005	<0.0005	ND	30	101	60	130	89	50	140
Ethylbenzene	GCM0334-MAY23	mg/L	0.0005	<0.0005	ND	30	102	60	130	90	50	140
m-p-xylene	GCM0334-MAY23	mg/L	0.0005	<0.0005	ND	30	102	60	130	90	50	140
Methyl ethyl ketone	GCM0334-MAY23	mg/L	0.02	<0.02	ND	30	100	50	140	107	50	140
Methylene Chloride	GCM0334-MAY23	mg/L	0.0005	<0.0005	ND	30	102	60	130	93	50	140
o-xylene	GCM0334-MAY23	mg/L	0.0005	<0.0005	ND	30	104	60	130	93	50	140
Styrene	GCM0334-MAY23	mg/L	0.0005	<0.0005	ND	30	102	60	130	93	50	140
Tetrachloroethylene (perchloroethylene)	GCM0334-MAY23	mg/L	0.0005	<0.0005	ND	30	101	60	130	85	50	140
Toluene	GCM0334-MAY23	mg/L	0.0005	<0.0005	ND	30	100	60	130	89	50	140
trans-1,3-Dichloropropene	GCM0334-MAY23	mg/L	0.0005	<0.0005	ND	30	98	60	130	89	50	140
Trichloroethylene	GCM0334-MAY23	mg/L	0.0005	<0.0005	ND	30	100	60	130	89	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates 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.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.
RL Reporting Limit.
↑ Reporting limit raised.
↓ Reporting limit lowered.
NA The sample was not analysed for this analyte
ND Non Detect

Results relate only to the sample tested.
Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.
"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.
Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

This report supersedes all previous versions.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Industries & Environment - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No: 031764 Page _____ of _____

Laboratory Information Section - Lab use only

Received By: KM
Received Date: 05 / 17 / 23 (mm/dd/yy)
Received Time: 13 : 50 (hr : min)
Received By (signature): KMcKenna
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ice
Temperature Upon Receipt (°C) 9.3
LAB LIMS #: EA-40228-May23

REPORT INFORMATION

Company: SOIL ENGINEERS LTD
Contact: GURKARANBIR SINGH
Address: 90 West Beaver Creek Richmond Hill
Phone: 519-731 6442
Fax:
Email: gurkaranbirsingh@soilengineersltd.com

INVOICE INFORMATION

☑ (same as Report Information)
Company:
Contact:
Address:
Phone:
Email:

Quotation #:
P.O. #:
Project #: 211-W043
Site Location/ID: 720 Granite Court, City of Pickering

TURNAROUND TIME (TAT) REQUIRED

☑ Regular TAT (5-7days)
TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days
PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture: ☐ Coarse
☐ Table 2 ☐ Ind/Com ☐ Medium/Fine
☐ Table 3 ☐ Agri/Other
☐ Table _____ Appx. _____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other:
☐ MISA _____
☐ ODWS Not Reportable *See note

Sewer By-Law:
☑ Sanitary
☑ Storm
Municipality: Durham

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	M&I: Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN, Hg pH,(B(HWS),EC,SAR–soil) (Cl, Na–water))	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI)	M&I: ICP Metals only (Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Tl,U,V,Zn)	SVOC: PAHs only	SVOC: SVOCs (all incl PAHs, ABNs, CPs)	PCB: PCBs (Aroclor ☐ Total ☐)	PHC: F1-F4 + BTEX	PHC: F1-F4 only (no BTEX)	VOC: VOCs (all incl BTEX)	VOC: BTEX only	Pest: Pesticides (Organochlorine or specify other)	Other: Metals Dissolved	Other	Other	Other	Other: Sewer Use: Storm & Sanitary; Specify pkg: Reg. of Durham	Other: Water Characterization Pkg (General ☐ Extended ☐)	SPLP: Specify tests (☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN)	TCLP: Specify tests (☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.)	COMMENTS:
1	BH/MW4	16/05/23	11:00AM	17	GW	N																				
2	BH/MW4	16/05/23	11:00AM	1	GW	Y												✓								
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

Observations/Comments/Special Instructions

Sampled By (NAME): Gurkaranbir Singh Signature:
Relinquished by (NAME): Gurkaranbir Singh Signature:

Date: 5 / 05 / 23 (mm/dd/yy)
Date: 16 / 05 / 23 (mm/dd/yy)

Pink Copy - Client
Yellow & White Copy - SGS

Revision #: 1.6
Date of Issue: 02 May 2022

Note: Submission of samples to SGS is acknowledgement that you have been provided direction on sample collection/handling and transportation of samples. {2} Submission of samples to SGS is considered authorization for completion of work. Signatures may appear on this form or be retained on file in the contract, or in an alternative format (e.g. shipping documents). {3} Results may be sent by email to an unlimited number of addresses for no additional cost. Fax is available upon request. This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. (Printed copies are available upon request.) Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.